ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

# ANNUAL MANAGEMENT REPORT
# -1984-
# KUSKOKWIM AREA

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## PREFACE

The 1984 Kuskokwim Area Annual Management Report is the twenty-fifth consecutive annual volume reporting on and detailing management activities of the Division of Commercial Fisheries staff in the Kuskokwim Area. Due to administrative changes, the 1960-1974 management reports for the Kuskokwim District appear in the Arctic-Yukon-Kuskokwim Area reports. This review emphasizes the descriptive account of the administration of the Kuskokwim Area commercial and subsistence fishery resources, as well as outlining management objectives and procedures. Although data from many special research projects are included in this report, complete documentation of these projects and results will be presented in separate reports.

Data presented in this report supercedes information found in previous management reports. An attempt has been made to correct errors in previous reports which are indicated by appropriate footnotes.

This report is organized into the following major sections:

I. Salmon Fishery

A. Introduction. This is a general and brief description of the area, its inhabitants, fishery resources, fisheries and management practices.

B. Area Summaries. These sections summarize current year data for the area commercial and subsistence fisheries and makes comparisons with previous years.

C. District Reports. There are several unique and separate fisheries in the area and separate comprehensive reports are presented for each.

II. Herring Fishery

A. Area Introduction and Fishery History. This is a general description of the area's herring stocks and fisheries.

B. Subsistence Fishery. This section summarizes current year and historic data on the subsistence herring fishery.

C. District Reports. There are several unique and separate fisheries in the area and separate comprehensive reports are presented for each.

III. Whitefish and Other Miscellaneous Freshwater Species Fishery

A. Introduction. This is a brief description of the various species and harvesting and processing methods of the area's miscellaneous freshwater species fishery.

B. Whitefish. This section presents information on whitefish including commercial catch data.

IV. Halibut Fishery
This is a brief description of Nunivak-Nelson Island Fishery.

In order to facilitate use of this report, the tabular data have been separated into current year tables and appendix tables where annual comparisons were made. Effort and catch per unit effort (C.P.U.E.) are derived as follows: total fisherman (based on the Entry Permit number, illegal fishermen are excluded) hours are computed by arbitrarily assuming that if a fisherman delivers in a fishing period, then the fisherman is assumed to have fished the complete period for as many hours as were open to commercial fishing. The resulting figure, total fishermen hours representing effort, is then divided into the catch during the same period to obtain C.P.U.E.

"Total fishermen" is the total number of fishermen who made at least one delivery during a particular season. There are a number of fishermen who deliver only once or twice during the entire season.

Commercial catch data are derived from computer tabulations of fish tickets.

The subsistence salmon catch data for 1983 and 1984 in this report contain preliminary figures. Subsistence catches reoprted in the 1983 Kuskokwim Annual Management Report and the 1984 subsistence catch data that has appeared in various documents was estimated in a manner (Jonrowe, 1983) that resulted in an over-estimate of the number of subsistence fishing families. The biometrics staff is examining the data base to determine what form of estimator can be used to finalize the catch estimates.

SALMON FISHERY
INTRODUCTION

## Area and District Boundaries

The Kuskokwim Area includes all waters of Alaska between Cape Newenham and the Naskonat Peninsula, plus Nunivak and St. Matthew Islands (Figure 1). Commercial salmon fishing is allowed by regulation in four districts in the area: District 1 consists of the Kuskokwim River from Eek Island to Mishevik Slough (Figure 2), District 2 consists of the Kuskokwim River from Mishevik Slough upriver to the Kolmakoff River near Aniak (Figure 3), District 4 consists of the waters of Kuskokwim Bay between Oyak Creek and the Arolik River adjacent to the village of Quinhagak (Figure 4), and District 5 consists of the waters of Goodnews Bay (Figure 5).

## Fishery Resources

All five species of Pacific salmon are indigenous to the area: chinook or "king" salmon (Oncorhynchus tshawytscha), sockeye or "red" salmon (O. nerka), coho or "silver" salmon (O. kisutch), pink or "humpback" salmon (O. gorbuscha) and chum or "dog" salmon (O. keta). The largest populations of chinook, sockeye, coho and chum salmon are found in the Kuskokwim River drainage. Pink salmon are widely distributed throughout the area, but the lack of commercial markets has resulted in little quantative data on the population size of this species.

## Fishery History

The Kuskokwim Area commercial salmon fishery is the oldest in the Arctic-Yukon-Kuskokwim (AYK) Region with catches reported as early as 1913. For many years, small commercial mild-cure operations were conducted in or near Kuskokwim Bay while the Kuskokwim River fishery remained virtually undeveloped. During the 1930's, when dog teams were intensely utilized for freight hauling, a commercial fishery operated in the McGrath area for the sale of dried salmon for dog food. This fishery declined with the diminishing use of dog teams. The Kuskokwim Area experienced little additional commercial effort until Alaska became a state more than 20 years later (Appendix Table 1).

The commercial salmon industry has grown significantly since statehood as area fishermen have been making the difficult transition from a subsistence culture to a cash economy. This has resulted in a tremendous increase in the number of fishermen sustaining their effort throughout the season. This can be seen in the increase in the number of fishermen who participated in the salmon fishery in the Kuskokwim Area (Appendix Table 2).

A semi-dory hull with a 4 to 5 foot wide bottom; measuring 6 to 8 feet wide at the gunwales and averaging 22 feet in length is the archetype vessel. These outboard powered boats are constructed by the fishermen of exterior grade 3/4 inch plywood (marine plywood is gaining in

popularity in recent years) and dimensional framing lumber. As Appendix Table 3 shows the average length has remained 22 feet while the horsepower has increased to 60 in recent years. The other change that is evident is the increase in aluminum and fiberglass manufactured hulls instead of the home-made wooden skiffs (Appendix Table 3). The trend toward increasing horsepower, more efficient hull types, and increased number of tenders (Appendix Table 3) has greatly improved the efficiency of the fleet. The overall expansion of the commercial fishery could not have been accomplished without the improvements in processing facilities that have occurred throughout the area.

The efficiency of the fleet has also been enhanced by the increased utilization of more efficient nylon and plastic drift gillnets. These gillnets are limited by regulation to 50 fathoms in length. Gillnets with a mesh size greater than 6 inches may not exceed 35 meshes in depth. Gillnets of 6 inch or less mesh size may not exceed 45 meshes in depth. Table 1 presents a summary of the gillnet specifications of nets sold during the 1984 season. The preferred colors are various shades of green.

## Management Program

The Division of Commercial Fisheries (D.C.F.) of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of the commercial and subsistence fisheries within the Kuskokwim Area. The permanent staff assigned to this area includes one area management biologist, one assistant area biologist, three project biologists and a clerk-typist. In addition, 18 seasonal employees are employed to assist the non-seasonal staff in conducting various management efforts and research studies.

The main objective of the Department's program is to manage the subsistence and commercial salmon fisheries on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, including assignment of subsistence as the highest priority among beneficial uses of the resource. Present commercial fishing regulations and management strategies have been developed to insure that sufficient fish are provided for the subsistence fishery and spawning ground requirements.

Due to the vast size of the area and the turbid nature of many streams, accurate estimates of the size of salmon returns and the spawning escapements are difficult to obtain. Fishery management is also hampered by the relative lack of comparative catch and return information since most of the fisheries have been expanding since their initiation. The management problem is further compounded by having to provide sufficient escapement after commercial fishing for the important subsistence fishery as well as for spawning purposes. In recent years, as the data base for the various escapement projects has expanded, it has become possible to use the projects for in-season management by analysis of migratory timing.

It has been a policy of ADF&G to conservatively increase the recent levels of commercial utilization for a few years in order to establish definite trends in the relationship between catch and return. If the escapement indices do not indicate a declining population and there is no apparent conflict in the catch allocation between the subsistence and commercial fisheries, then the commercial harvest guideline is increased. Commercial harvest guidelines are established based on the historical production of the district which is determined by the combining of subsistence and commercial catches, and escapement indices.

Adjustments of the time allowed for commercial fishing is the primary method of distributing the harvest throughout the return to avoid over-harvesting discreet stocks, to stay within the harvest guidelines, and to allow sufficient fishing time for the subsistence fishery. Depending on the species, district and return magnitude commercial fishing periods vary between 6 to 12 hours in length. Adjustments of commercial fishing time are made during the season in response to return magnitude as indicated by commercial catch data and various Department field studies. A recently established Department test fishing program near Bethel has provided promising new information on return timing and magnitude. Evaluation of annual spawning escapements is accomplished through aerial surveys of "key" streams and lakes throughout the area, a weir project in the Holitna drainage, sonar counters on the Aniak and Kanektok Rivers and a counting tower on the Goodnews River.

In 1983, provisional salmon spawning escapement objectives were established for the area's major spawning systems. These objectives were established based on the average aerial survey indices obtained in these systems under good to fair survey conditions since 1960 (Appendix Table 9). The objectives are considered to represent the escapement levels needed to maintain the salmon returns at past levels and may require future adjustment to maximize salmon production. Spawning escapement assessment is being emphasized in the Department's program to provide greater species and geographic coverage than has been possible in the past.

It should be pointed out that increases in commercial fishing effort and efficiency have occurred that have balanced the declines in subsistence utilization and the increases in harvest guidelines. This has resulted in present regulations being maintained or in some cases the regulations becoming more restrictive.

A problem special to the area is the language barrier. Many of the people cannot read or speak English or more often English is a second language. This requires the staff to be careful not to use jargon or metaphores that are outside the experience of the majority of people. Translators often must be used at public meetings but accurate translations are difficult, particularly under the sometimes stressful conditions of the meetings. In addition, many special regulation notices are broadcast over local radio stations in English and Yup'ik languages.

To assist in the information and education program, a weekly fishery program is broadcast over radio station KYUK in Bethel during the summer months. Additionally, the Department contributes to a weekly newspaper, The Tundra Drums.

## SALMON
## Area Summary--Commercial Fisheries

### Fishing Effort

In recent years, fishermen participation levels have risen in the lower Kuskokwim River (District 1) and Quinhagak (District 4) which have become the centers for most Kuskokwim Area fishermen. This is due to the close proximity to population centers and the liberal harvest guidelines associated with these fisheries. Goodnews Bay (District 5) has also been showing a slight increase in effort in recent years which is partially due to improved marketing availability in this fishery. The middle Kuskokwim River (District 2) has been relatively stable. The poor marketing opportunities in District 2 are primarily caused by the reduced quality of the salmon as they ascend the Kuskokwim River. A summary of the effort levels in these districts is presented in Appendix Table 2.

Recent increases in fishing effort may appear to be somewhat of a contradiction considering that 835 permits were issued in 1976 to fishermen based on points earned by past participation in the fishery by the Limited Entry Commission. No other permits have been available since that time. In January of 1984, the total number of permits was 831 since 4 permits had been revoked by the Commercial Fisheries Entry Commission because of administrative error, forfeit, or criminal action. 1/ In 1976, all 835 permits were held by Alaskan residents, in January 1984, 828 of the 831 permits were owned by Alaskan Residents.[17] Some families were eligible for more than one permit, likewise many elderly fishermen were eligible. Many of these fishermen, after having received a permit, did not immediately participate in the fishery. These inactive permits have since been transferred and/or sold to more aggressive fishermen. In 1984, 813 Kuskokwim Area permits were renewed (Table 2), only 744 of these permits were used and 90 percent (798) of these fishermen were residents of the area (Table 2).

Kuskokwim Area permit holders are allowed to move freely between districts so the district participation data does not correspond with the total number of permits renewed in the area since some fishermen fish in more than one district and, therefore, are counted more than once. The total number of fishermen making at least one delivery in the area in 1984 was 744 (Appendix Table 2).

1/ Dinneford, 1984

## Catches

The 1984 season total commercial catch of salmon was the largest on record exceeding the previous record catch by 28 percent. The total harvest of 1,497,662 salmon was composed of 74,006 chinook, 81,307 sockeye, 829,965 coho, 23,902 pink and 488,482 chum salmon (Table 3). The coho salmon catches in all four districts were the largest on record and were partially responsible for the record harvest in 1984. The catches of the other species were similar to or above the previous five-year averages (Appendix Table 4).

Kuskokwim Area fishermen received a record of approximately $5,809,000 for their 1984 catch (Appendix Table 5). The average price per pound paid to the fishermen was $0.89 for chinook, $0.52 for sockeye, $0.55 for coho, $0.07 for pink and $0.28 for chum salmon (Appendix Table 6). The salmon prices were higher in 1984 than previous years for all species except for chum salmon (Appendix Table 6). The average Kuskokwim Area fishermen earned approximately $7,505 in 1984.

The chinook salmon catch of 74,006 (Table 3) was 104 percent of the previous five-year average of 70,885 (Appendix Table 1). This was primarily due to the above average chinook salmon catches in Districts 4 and 5 (Appendix Table 4).

The commercial sockeye salmon catch of 81,307 (Table 3) was 108 percent of the previous five-year average (Appendix Table 1). This was due primarily to the improved species identification of sockeye salmon in the catch in Districts 1 and 2 which began in 1981. As a result, the previous five-year average still includes two years (1979 and 1980) in which most Kuskokwim River sockeye salmon were reported as chum salmon. This artificially lowers the five-year average for sockeye salmon and raises the five year average for chum salmon.

The commercial coho salmon catch of 829,965 (Table 3) was a record in all districts and 240 percent of the previous five-year average of 346,329 (Appendix Table 1). The Kuskokwim River districts' catch was 241 percent, while the catches in District 4 and District 5 were 390 percent and 482 percent, respectively, of the previous five-year averages (Appendix Table 4). The record catches were made possible by the largest coho salmon return in the history of the fishery combined with the processing capability to handle the catch and improved management techniques that allowed the identification of the large return in-season. In even numbered years since 1978, the coho salmon returns have been showing a steady increase in magnitude. Environmental conditions are one reason for this increase, but the exclusion of the high seas salmon fleet from a portion of the North Pacific Ocean in 1978 significantly reduced their coho salmon catch. Its believed that this reduction in interception contributed to the increase in return magnitude. The reason for the failure of the odd year coho salmon returns to display a similar increase is unknown.

The pink salmon harvest of 23,902 (Table 3) was 239 percent of the previous five year average of 9,996 (Appendix Table 1). The pink salmon in the Kuskokwim Area show a high return in even years which makes the previous 5-year average rather meaningless. In addition,

pink salmon are purchased as a "bonus" by most area processors. Most of these fish are given away or disposed of and not exported from the area for sale. Due to the small average size of most of the area's salmon fishing vessels, pink salmon are often not retained by fishermen if the space saved can be used for more profitable species.

The chum salmon catch of 488,482 (Table 3) was 124 percent (Appendix Table 1) of the previous five-year average. This large catch was due primarily to the strong return to all four districts (Appendix Table 4).

## Buyers and Processors

There were 13 salmon buyers and processors that operated during 1984 in the Kuskokwim Area (Table 5). Eight companies operated for varying lengths of time during the salmon season in the Kuskokwim River districts. Four companies operated in District 4 and six companies operated in District 5. The available processor capacity was adequate to handle the 1984 salmon harvest in the Kuskokwim Area except in Districts 4 and 5 where there were no processors available during the last commercial opening of the season.

Appendix Table 7 shows the commercial salmon pack by species in the round since 1968. The record number of salmon harvested in 1984 resulted in a record commercial salmon pack.

Salmon are exported from the area to fresh and frozen markets. There are no canneries operating in the area, however, some of the fresh fish were flown to canneries in other areas. In addition some salmon from Bristol Bay Area were flown to Bethel for freezing in 1984.

## Emergency Orders

A listing of emergency orders issued during 1984 season describing actions taken and a justification of each is presented in Table 6.

## Enforcement

The Department and public worked diligently with the Division of Fish and Wildlife Protection (Department of Public Safety) to conduct a comprehensive enforcement program. The public provided important information on several cases in 1984. Major problems were: commercial/subsistence fishing during closed periods (28 cases), commercial fishing without proper licensing (19 cases) and assorted other violations. Compliance in general appears to continue to improve since 131 cases were initiated in 1982, 82 cases in 1983 and 68 cases in 1984.[2/]

2/ Rogers, pers comm.

As in the past, the Department of Fish and Game vigorously pursued a program of informing the public of regulation changes by utilizing the local radio and television station, citizen band (C.B.) radio, telephone and personal contact.

## SALMON FISHERY
## AREA SUMMARY--Subsistence Fishery

### Introduction

The DCF staff of the ADF&G is responsible for the management of the subsistence fisheries within the Kuskokwim Area. Area residents have long depended upon fishery resources as a source of food. Traditional fishing methods and materials limited the size and scope of the early fishery. Spears, dip nets, hook and line, fish traps and willow or caribou strip gill nets have been supplanted by efficient nylon gill nets. Although some communities and some individuals continue to use traditional gear. Herring, whitefish, cisco, blackfish, pike, burbot and sheefish (see Appendix Table 8) have been historically utilized along with salmon for subsistence. The regulations are very liberal for any species; no permits are required and for all species other than salmon only general statewide regulations restrict methods and means.

In recent years, the more intensive use of salmon for subsistence and commercial fisheries has resulted in some regulation of the subsistence salmon fishery to prevent illegal commercial fishing under the guise of subsistence fishing. As a result, there are closed subsistence fishing periods in Districts 1, 4 and 5 immediately before, during and after commercial fishing periods.

### Harvest Documentation

Calendars on which to record daily salmon catches are sent to known subsistence fishing households annually. These are then collected and further catch information obtained during household surveys conducted following the chinook, sockeye and chum salmon return. In 1983 and 1984, there were no funds allocated to the Kuskokwim Area subsistence survey project. Because the subsistence harvest is a major portion of the total catch and of great importance to the local economy, an effort was made to collect as much data as possible using existing staff and funds. This required a departure from the total census of nearly all fishing villages undertaken in previous years. Instead, the subsistence salmon harvest was estimated from a census conducted in a subsample of villages. In 1983 due to the unexpected funding cut, the surveyed villages were chosen because of ease of accessibility to existing personnel and projects. In 1984, the sampled villages censused had taken the largest portion of the chinook salmon catch in previous years. In both years, census data was available from the Subsistence Division (SD) on villages in which they were conducting studies and from the three villages censused by existing CFD Staff in Districts 4 and 5. A small number of households retuned their catch calendars (calendars were prepared and mailed in both years) and this information was used where possible.

During the village surveys, all available households were contacted and harvest data obtained. Prior to 1983, uncontacted households were classified as "fished" or "did not fish" based on information provided by the households contacted in the village. The total catch for the village was then estimated by assuming that the uncontacted households that were reported as having fished had taken the household average catch of the contacted households that had fished. Households which had not been contacted and for which no information on their fishing activities were available were assumed to not have fished.

In 1983 and 1984, due to an oversight, the information on the whether or not the uncontacted households had fished was not collected by the CF interviewers in the Kuskokwim River villages. Following a careful review of the expansion technique used in 1983 (Jonrowe, 1984) and in-season in 1984 by the CFD and SD, it was determined that it resulted in an overestimate. The error came about through using the calendar mailing list as the basis for the total number of households in the village. This mailing list has never been maintained for that purpose and as a result caused an overestimate of the number of fishing households among the uncontacted fishing households. The catch in the sampled villages was then divided by the recent three year average (1980-1982) proportion of the subsistence catch recorded during the fall census. This procedure was also carefully reviewed and was found to give a similar (but lower value) than a linear regression estimator for lower Kuskokwim chinook salmon. The proportion estimator had a very large confidence interval while the regression estimator provided a much smaller confidence interval. The linear regression estimator could not be used to estimate catched because the regressions for other strata (other salmon, middle and upperriver chinook salmon, etc.) failed to provide significant relationships between surveyed village catches and total stratum catches.

The preliminary figures provided in this report for 1983 and 1984 were derived by using the five year average (1978-1982) number of subsistence fishing households in the sampled villages as the number of fishing households in the village (Table 7). The number of fishing households found in the census was then subtracted from the five year average to determine the number of uncontacted fishing householdes (Tables 8 and 9). The known catch was then expanded to the total catch by the previously described proportion of catch method (Tables 10 and 11). These figures are comparable to the data collected by the previous census technique. However, these figures are probably low since several villages (see footnotes in Tables 8 and 9) had as many or more fishing households than the previous five year average in spite of not all of the households being contacted. In addition, where the more accurate linear regression estimator worked, somewhat higher values were obtained. In addition, several villages in the upper Kuskokwim Drainage and in Kuskokwim Bay have not been surveyed in the past so their catches are not included in the total harvest estimates. The preliminary figures for the Kuskokwim River subsistence catch 1983 and 1984 have been rounded to the nearest hundred of fish to make them easily discernible from the previously collected census data.

The Kuskokwim River is divided into three strata; the lower Kuskokwim which corresponds to commercial fishing District 1 (see Figure 2), the middle Kuskokwim River which corresponds to commercial fishing District 2 (see Figure 3), and the upper Kuskokwim River which consists of the rest of the drainage above the Kolmakoff River (Figure 1). This stratification places villages subject to similar effects of commercial fishing and subsistence regulations into the same strata. The upper Kuskokwim River harvest has only been documented by CFD to the village of Stony River in most prior years. In recent years, SD has provided data on selected villages above Stony River.

## Catches

The 1984 total subsistence salmon catch of 228,546 was 103 percent of the previous five year average of 221,356 (Appendix Table 1).

## DISTRICT REPORTS
## Kuskokwim River Commercial Fishery

Two commercial fishing districts (Districts 1 and 2) depend on Kuskokwim River stocks. The greatest amount of fishing effort and the largest commercial salmon catches occur within the 106 mile-long District 1 (Appendix Table 10). There are 12 villages and at least 15 temporary fish camps located within the boundaries of this district. District 2, which contains five villages, has a small commercial fishery limited by regulatory guideline harvest levels.

Set and drift gill nets are the legal commercial gear that can be operated in the Kuskokwim River. The gill nets cannot exceed 50 fathoms in length. There are no mesh size restrictions on nets operated in District 1 and 2 through 25 June, most nets used during this time consist of eight inch stretched mesh nylon webbing (Table 1). After 25 June, a six-inch maximum mesh size restriction is in effect in Districts 1 and 2 and most nets are 5 1/2 inch stretched nylon mesh (Table 1). The portion of District 1 above Bethel is also closed to commercial salmon fishing between 26 June and 31 July.

Lower Kuskokwim River commercial fishermen operate highly mobile drift gill nets. This type of fishing involves laying out 35 to 50 fathoms of gill net from a skiff and then drifting with the river current. Drift net fishing requires a section of river that is relatively free of snags. Set gill nets are not utilized to a great extent by commercial fishermen and are used mainly for subsistence fishing. Commercial set gill nets are fished in small eddies along the bank of the Kuskokwim River and larger eddies out in the main river. Set gill netting is done with much shorter nets, usually 5 to 15 fathoms in length.

Several important regulations affecting commercial fishing effort in District 1 are:

1) Until 26 June, commercial fishing periods are regulated by emergency order. This allows scheduling of the chinook

salmon harvest to provide for the subsistence fishery and effort to be regulated according to the variable magnitude of the chinook salmon return.

2) From 26 June through 31 July commercial fishing periods are from 1800 hours to 2400 hours on Monday and Thursday by regulation to allow for the development of the chum salmon fishery.

3) Commercial fishing is allowed only below Bethel (the lower 86 miles of river) during the "chum salmon season" (26 June to 31 July). Restricting fishing to the lower portion of the district enhances fish quality, helps prevent excessive harvest and wastage, and allows subsistence demands to be met.

4) After 31 July, commercial fishing periods are again regulated by emergency order. This allows fishing effort to be regulated according to the variable magnitude of the coho salmon run.

Commercial fishermen in District 2 operate under conservative regulatory harvest guidelines of 2,000 to 4,000 chinook salmon; 4,000 to 8,000 chum salmon; and 2,000 to 4,000 coho salmon. The majority of commercial catches are taken in the Kalskag area. All commercial fishing periods in District 2 are established by emergency order. The periods are typically six hours in duration as in District 1. In addition, the periods in District 2 are simultaneous with the commercial periods in District 1 to prevent massive effort shifts and resulting overharvest of salmon stocks in District 2. The first commercial period in District 2 normally occurs three to four days following the first opening in District 1 to allow the peak of the chinook salmon return to enter the district.

District 1:

Commercial salmon fishing opened in District 1 on 18 June and this was the latest opening in the history of the fishery. Environmental factors and subsistence catch information indicated that the salmon migratory timing was late (Appendix Table 11). By 13 June, chinook salmon catches were occurring at Aniak with subsistence catches reported as adequate by District 1 villages. The management strategy calls for the above conditions and the test fishery indicating a sustained run before the first opening. The drift test fishery was in its first year of operation on chinook salmon and catches were sporadic. The opening was announced for 18 June based on the above factors. Commercial fishing with unrestricted mesh size was limited to the usual two 6-hour fishing periods on 18 and 21 June when 17,181 chinook salmon were landed (Table 14).

The strong chum salmon catch on 21 June (Table 14) resulted in the decision to advance the restricted mesh season from its regulatory date

of 26 June to 25 June. The primary reason for this action was to maintain the Monday-Thursday fishing schedule so that the subsistence fishermen could anticipate the required closures. Commercial catch data, escapement data (Aniak and Kogrukluk rivers) and test fishing indicated a strong chum salmon return and fishing continued on the regulatory schedule until 16 July (Table 14). This was the longest restricted mesh season in the history of the fishery. Fishing was closed on 16 July when escapements and test fishing catches began to lag.

The commercial fishery was reopened on 30 July when the test fishery showed that the majority of chum salmon had passed through District 1 and that coho salmon were the primary species available. Following the second opening on 2 August, the test fishery, early escapement results and commercial catch data indicated that the coho salmon return was above average in magnitude. Fishing time was increased to nine hours on Monday and Thursday until 30 August. District 1 closes by regulation on 1 September, however, test fishing, escapement and commercial catches still indicated a harvestable surplus of salmon was available. The season was extended until 6 September by emergency order. During the final commercial fishing period on 6 September, only one processor was open to receive fish and no tender boats were on the river.

Six hundred and fifty-four commercial fishermen participated in the District 1 fishery landing 29,946 chinook; 46,571 sockeye; 605,098 coho; 2,931 pink; and 396,031 chum salmon (Table 14).

District 2:

A single 6 hour opening on 21 June was the only unrestricted mesh opening in District 2 in 1985. The chinook salmon catch was 561 (Table 15). Fishing resumed with restricted mesh on 25 June. The opening on 28 June took 13,376 chum salmon, which exceeded the harvest guideline of 4,000 to 8,000 chum salmon and brought the season total catch to 19,081 (Table 15). Due to the strong chum salmon return, another period was allowed on 2 July at which time the season was closed to maintain the Board intent to limit this fishery (Table 15).

Commercial fishing reopened on 6 August when coho salmon were the predominate species available. The harvest guideline of 2,000 to 4,000 coho salmon was exceeded with the first period's catch of 4,339 (Table 15). The Board established harvest guideline was 1 to 2 percent of the usual District 1 catch. On this basis, commercial fishing was allowed to continue until the regulatory closure on 1 September. The last two periods on 27 and 30 August had no effort due to buyers pulling out of the district. The buyers ceased operation due to other commitments and the declining quality of the catch. Fifty-eight fishermen participated in the District 2 fishery in 1984 and landed 1,796 chinook, 2,004 sockeye, 18,349 coho, 11 pink, and 27,687 chum salmon (Table 15).

Chinook salmon:

Combined annual commercial and subsistence harvests of Kuskokwim River chinook salmon averaged 52,965 fish from 1960 to 1969, but increased to 81,383 from 1970 to 1979. The combined commercial and subsistence harvest in 1984 was 88,942 chinook salmon, down from the previous (1979-1983) five year average of 95,842 (Appendix Table 12). In spite of the decline in utilization, chinook salmon escapement indices (Appendix Tables 13, 14) were poor compared to objectives (Appendix Tables 9) for the second year in a row. Annual commercial catches ranged between 30,000 and 40,000 chinook salmon from 1968 to 1972. A commercial harvest guideline, as defined in the management plan, has been kept within this range in an attempt to stabilize the fishery until additional data regarding run size and escapement has been obtained. Small returns were experienced during the years 1974, 1975, 1976 and 1983 indicating that this harvest range may have been too optimistic. Commercial harvests since 1976 have ranged from 30,000 to 48,000 fish taken throughout the season. The commercial harvest of 31,742 chinook salmon (Appendix Table 12) in 1984 resulted in escapements being 51 to 84 percent below the escapement objectives, again indicating that a harvest guideline of 30 to 40 thousand is too optimistic for normal and small returns of chinook salmon.

Sockeye Salmon:

Sockeye salmon are harvested incidentally to the other salmon in Districts 1 and 2. Historically, fishermen and processors have not accurately identified sockeye and chum salmon in their commercial or subsistence catches in the Kuskokwim River. For this reason, the true magnitude of the historic sockeye and chum salmon harvest in the Kuskokwim River has not been accurately documented. Since the 1981 season, fishermen, processors and the Department have worked together to properly identify each species in the commercial harvest. Sockeye salmon have comprised 10 to 20 percent of the chum-sockeye salmon catch since 1981. In 1984, the commercial harvest was 48,575 sockeye salmon (Appendix Table 4) which was 8.5 percent of the chum-sockeye salmon catch. The only sockeye samlon escapement program in the Kuskokwim drainage is Kogrukluk Weir. The escapement objective of 2,000 (Appendix Table 9) was exceeded with an escapement of 4,130 sockeye salmon (Appendix Table 14).

Chum Salmon:

Prior to 1971, chum salmon catches represented only fish taken incidentally to the chinook and coho salmon fisheries. A commercial chum salmon fishery was initiated in 1971 due to the following factors:

1. Early subsistence catch estimates for the period 1927-1943 indicate an average annual catch of 448,000 chum salmon, compared to an average 221,000 chum salmon taken yearly during the 1960-1970.

2. There are a minimum of 49 known chum salmon spawning tributaries. Most of these streams cannot be surveyed annually due to budget limitations and adverse stream or weather conditions. As many as 185,000 spawning chums have been counted in a single year in just three of these tributaries. These two factors indicated that the chum salmon population was large enough and productive enough to support a directed commercial fishery.

Total utilization figures (commercial plus subsistence) have increased steadily since the inception of the commercial chum salmon fishery with a record of 646,947 fish caught in 1980 (Appendix Table 15) without any major reductions in escapement.

This season's total commercial chum salmon catch of 423,718 (Appendix Table 15) was the second highest on record and only exceeded by the parent year of 1980. Chum salmon escapement objectives (Appendix Table 9) were achieved or exceeded in all systems upstream of and including the Aniak drainage (Appendix Table 13). Index streams downstream of the Aniak drainage had poor escapements (Appendix Table 13).

Coho Salmon:

The commercial coho salmon catch of 623,447 was the largest on record, 39 percent higher than the previous record 1982 harvest (Appendix Table 4). Due to comparative catch, escapement and test fishing data, which indicated that an above average return, was in progress, Districts 1 and 2 were allowed a liberal fishing schedule. District 1 was allowed eight 9-hour periods, rather than the usual 6 hour fishing periods and the season was extended for two periods beyond the regulatory 1 September closing date. District 2 was allowed to exceed the upper end of the harvest guideline range by 14,000 fish and fishing was allowed to continue until the regulatory closure on 1 September.

The only coho salmon escapement objective is for the Kogrukluk River Weir count (Appendix Table 9). The escapement objective was slightly exceeded by the 29,824 coho salmon which entered the Kogrukluk River (Appendix Table 14).

Appendix Tables 16 to 20 present more detailed comparative subsistence and commercial catch data which are primarily used for management purposes. The historic values in these tables are compared to the current year's values inseason to provide the Department with some insight into what the probable final results of the fishing season will be on the salmon stocks.

## Kuskokwim Bay Commercial Fishery

There are two commercial fishing districts in Kuskokwim Bay. District 4, Quinhagak (Figure 4) and District 5, Goodnews Bay (Figure 5). The commercial fishery began in District 4 in 1960 while the District 5 fishery began in 1968. The prevailing commercial gear employed in

Districts 4 and 5 consists of drift gill nets that are fished in tidal channels radiating from the Kanektok and Arolik Rivers (District 4) or Goodnews River (District 5). Additionally, fishermen are required to use six inch or less stretched mesh nets during the entire season. This prevents the selective harvesting of the larger, more productive female chinook salmon while allowing the harvest of the more abundant and smaller male chinook, sockeye and chum salmon. Chinook, sockeye and chum salmon migration timing is nearly simultaneous in these two districts.

The village of Quinhagak is the only community within the boundaries of District 4. However, increasing numbers of lower Kuskokwim River fishermen now fish this district. This has caused an increase in fishing effort in recent years, particularly during the chinook salmon migration (Appendix Table 2).

The villages of Goodnews Bay and Platinum are located within the boundaries of District 5. The majority of the fishermen who fish in this district are from these local villages.

All commercial fishing periods in Districts 4 and 5 are established by emergency order. The periods are normally 12 hours in duration. The first commercial fishing period normally occurs between 13 and 20 June and depends on the entry pattern of chinook salmon into the Kanektok and Goodnews Rivers.

The 1984 commercial fishing season opened in District 4, Quinhagak and District 5, Goodnews Bay on 18 June with a 12 hour period from 1800 hours 18 June to 0600 19 June. These two districts remained on a schedule of two 12-hour periods per week until 11 July when District 4 was placed on a three 12-hour period per week schedule. Sockeye salmon escapement in Goodnews Bay was progressing at an acceptable rate, but could not support an increase in the rate of harvest. Therefore District 5 remained on the two 12-hour period per week schedule. On 23 July, the majority of the Goodnews Bay sockeye salmon migration had passed through the district and the magnitude of the chum and coho salmon migration appeared adequate to support an increased harvest. The schedule was increased in District 5 to three periods per week. Both districts remained on this three period per week schedule until 8 September when the season closed by regulation.

In both Kuskokwim Bay districts, only one period was missed due to a lack of buyers, this occurred on 7 September. However, several periods did experience inclement weather which hampered fishing effort.

District 4:

The 1984 commercial salmon harvest set a new season record of 252,925 salmon. The commercial catch consisted of 33,652 chinook, 17,258 sockeye, 135,342 coho, 16,249 pink and 50,424 chum salmon (Table 16). The coho salmon catch was the largest on record for this district (Appendix Table 4). All 1984 catches were above the previous five year average (Appendix Table 4). There were four processors which operated at least one fishing period in District 4 (Table 5).

A total of 260 fishermen made at least one delivery (Appendix Table 2) with a record of $1,280,000 paid to fishermen. The average income was $4,900 per fisherman.

The 1984 average weight of salmon and price paid in District 4 are listed in Table 4.

During the 1984 subsistence survey, all of the known subsistence fishing families were contacted. The village subsistence harvest was reported to be 3,157 chinook, 309 sockeye, 2,131 coho, 295 pink and 634 chum salmon (Table 17).

Six aerial salmon surveys were conducted on the Kanektok River during the 1984 season. The 27 July, 1984 survey was conducted at the near-peak spawning stage for both chinook and chum salmon and slightly prior to the sockeye salmon peak. A total of 11,282 chinook, 30,910 sockeye and 48,360 chum salmon were enumerated (Appendix Table 13). These surveys documented that escapement index levels for chinook salmon exceeded the aerial survey index objective established for the Kanektok River (Appendix Table 9). Both sockeye and chum salmon excapements were slightly below objectives (Appendix Table 9).

An aerial survey was flown on 26 August, 1984 and a total of 46,830 coho salmon were enumerated (Appendix Table 13). There is no adequate historical coho salmon survey data for comparison, but it is probable that this coho salmon escapement index is representative of an excellent coho salmon escapement.

The Division of Commercial Fisheries conducted a sport fish creel census from 16 June through 8 July 1984 on the Kanektok River. The census revealed a total of 614 anglers fishing 2,992 user-days and a harvest of 476 chinook, 35 sockeye, 2 coho, 27 pink and 270 chum salmon along with 32 Dolly Varden, 28 rainbow trout, 21 grayling and 8 lake trout. The results are explained in more detail in a separate project report (Snellgrove, 1984).

Additionally, a seven day float trip was conducted in early August on the Kanektok River to collect carcass samples of the escapement. The age and sex composition of the salmon carcasses sampled are presented in a more detailed separate report (Snellgrove, 1984).

District 5:

The 1984 commercial salmon harvest set a new season record of 114,313 salmon landed in the Goodnews Bay District (Appendix Table 4). The commercial catch was composed of 8,612 chinook, 15,474 sockeye, 71,176 coho, 4,711 pink and 14,340 chum salmon landed (Table 18). The coho salmon catch was the largest on record. The numbers of all other salmon caught were above the previous five year averages (Appendix Table 4). Five processors operated at least on period in District 5 this season (Table 5).

A total of 77 fishermen (Appendix Table 2) made at least one delivery in this district in 1984. The price paid to the fishermen was a record $758,000 which provided an average income $9,300 per fisherman.

The average fish weight and price paid in District 5 are listed in Table 4.

An estimated 3,260 chinook, 32,053 sockeye 13,744 pink, 19,003 chum and 249 coho salmon passed the middle fork Goodnews River counting tower in 1984. The chinook salmon escapement estimate met the escapement objective. The sockeye salmon estimate was 8 percent below the minimum objective and chum salmon were 6 percent above the maximum escapement objective. More detailed information on this project is presented in a separate report (Schultz, 1984).

During the 1984 subsistence survey, 22 Goodnews Bay fishing families were contacted. The reported catch was expanded to the estimated 42 fishing families in Goodnews Bay. This resulted in an estimated total subsistence catch of 629 chinook, 964 sockeye, 154 coho, 66 pink and 189 chum salmon (Table 17).

Four aerial surveys of the Goodnews River and its middle and south fork were conducted (Appendix Table 13). On 27 July, an aerial survey was conducted near the peak of spawning for chinook, sockeye and chum salmon. The aerial escapement obtained on this survey were expanded by a correction factor derived by comparing the index count above the tower on the middle fork to the tower count (Schultz, 1984). This provided an estimated total escapement of 8,743 chinook, 67,213 sockeye and 117,739 chum salmon for the Goodnews drainage. Combining the commercial and subsistence harvest with the estimated total escapement resulted in an estimated total return of 17,984 chinook, 83,651 sockeye and 132,268 chum salmon. The commercial exploitation rates were estimated at 48, 18 and 11 percent for chinook, sockeye and chum salmon, respectively (Schultz, 1984).

An aerial survey of the Goodnews River was conducted on 26 August during which 43,925 coho salmon were counted (Appendix Table 13). The majority of the coho salmon were seen in the lower portion of the river and were not yet spawning. Comparative coho salmon escapement data is not available for the Goodnews River. However, indications are that this is a good to excellent escapement index for coho salmon in the Goodnews system.

Additionally, a seven day float trip was conducted in early August on the north fork of the Goodnews River to collect carcass samples from the escapement. The age and sex of the carcasses sampled are available in a separate report (Snellgrove, 1984).

## HERRING

### Introduction

Pacific Herring (Clupea harengus pallasi) are known to spawn in various coastline locations of the Kuskokwim Area from Cape Newenham north to the Naskonat Peninsula. These areas include the bays and coves found along the coastline from Cape Newenham north to Carter Spit, including Security Cove, and Goodnews Bay. Additionally, spawning occurs along portions of Nunivak Island and throughout Cape Vancouver and the Northern shoreline of Nelson Island (Figure 1). The arrival of spawning herring in the Security Cove and Goodnews Bay districts usually occurs from the first to the middle part of May and continues until the first week in June. At Nunivak and Nelson Islands, the arrival and spawning of herring occurs from mid-May through mid-June.

During the late 1970's, aerial surveys of these areas indicated a trend of increasing herring abundance. This increase in abundance may be attributed to the following reasons: 1) improved survival due to less severe environmental conditions in recent years; 2) reduction of offshore foreign trawling; and 3) elimination of the near-shore Japanese gill net fishery. At that time, an interest began to develop in the commercial harvest of these herring stocks.

The subsistence use of fish and game resources has been designated by the Legislature (State Law 151) as the highest priority among beneficial users. In recognition of the subsistence harvest in the Nelson Island area and the lack of long term biological data, the Board of Fisheries has not permitted the development of a commercial fishery in that area. It was determined, however, that a harvestable surplus of herring was present in the Security Cove and Goodnews Bay at sufficient levels to support both a subsistence and conservative commercial fishery. In December of 1977, the Board of Fisheries established the present commercial fishing districts. The Security Cove District includes all waters between the northern most point of Carter Spit and Cape Newenham, excluding Goodnews Bay (Figure 6). The portion of Goodnews Bay located inside markers placed near the mouth of the Bay entrance and a line drawn between markers near the mouth of the Goodnews River describe the Goodnews Bay District (Figure 5). A regulatory structure was adopted and commercial herring fishing was opened for the first time in the spring 1978. Appendix Table 21 summarizes regulation changes affecting the herring fisheries during 1977-1984.

Appendix Table 22 shows the estimated herring biomass in metric tons from 1978 through 1984 in Security Cove and Goodnews Bay districts. Peak abundances of 19,500 mt and 6,700 mt were recorded during 1979 in the Security Cove and Goodnews Bay districts, respectively. The commercial harvest has steadily increased since the inception of these fisheries in 1978, peaking in 1981 when fishermen harvested 1,064 metric tons of herring in the Security Cove District and 596 metric tons in 1984 in the Goodnews Bay District (Appendix Table 23). These commercial districts have supported primarily sac roe and, to a lesser

extent bait herring fisheries harvested by fishermen operating set gill nets. The exception was in 1978 when seven purse seiners landed 259 metric tons of herring from the Security Cove District.

The price structure in these commercial sac roe herring fisheries is based on the roe percentage or recovery of the catch by metric ton. Roe recovery is determined primarily by industry technicians who process one or more samples from each delivery. "Immature" or "unmarketable" roe is not included in the roe weights although the weight of "immature" fish is included. A delivery of herring that is determined to have 6 percent roe recovery or less is usually sold for bait. Average roe recovery has remained fairly stable at 8.1 percent to 11.8 percent in the Security Cove District from 1979 through 1984. The Goodnews Bay District has experienced a great deal of fluctuation with an average annual roe recovery as low as 4.7 percent in 1979 and as high as 10.1 percent in 1984 (Appendix Table 23).

The peak commercial fishing effort to date for the Security Cove and Goodnews Bay districts occurred in 1980 when 175 and 165 fishermen made landings in these two districts, respectively (Appendix Table 24).

Subsistence Fishery

Coastal residents in this area have always utilized herring for subsistence purposes. Subsistence utilization of herring depends largely upon on the availability of alternative nutritional resources.

The 1984 subsistence survey of Nelson Island was not conducted because of limited funds. The villages of Nelson Island, which include Newtok, Tununak, Toksook Bay and Nightmute, have traditionally harvested herring with short gill nets. The nets are often no longer than 10 fathoms, and are operated near the villages as herring move inshore during the spring to spawn. D.C.F. has conducted a household survey in these villages from 1975 through 1982 in an effort to define the harvest and dependence on herring (Appendix Table 25). Subsistence users in these villages have shown a steady dependence on the spring herring, with an average of 77 families harvesting a minimum of 75.2 metric tons per year for the period from 1975-1981. The herring are primarily dried in strings and stored to be used throughout the remainder of the year. Fishermen tend to prefer the "second run" or the younger age class fish for this purpose because they are smaller, contain less body fat and are easier to dry. Other villages that are dependent on subsistence herring fishery to a lesser degree include Chefornak, Kipnuk, Kongiganak, Kwigillingok, Mekoryuk, Quinhagak, Goodnews Bay and Platinum.

The estimated biomass of herring in the Nelson and Nunivak Islands populations peaked at 16,074 mt in 1984 (Appendix Table 22). This biomass indicates these stocks may have recovered to a level that could support both commercial and subsistence fisheries.

## Commercial Fishery

Six processors purchased herring in the Kuskokwim Area in 1984. Four companies operated in Goodnews Bay and four operated in Security Cove (Appendix Table 24). The catch was frozen and off loaded onto freight vessels present on the grounds or nearby at the Togiak herring fishery.

A total of 900 mt of herring was landed during the 1984 commercial fishing season. Herring prices ranged from $250 per short ton for 10 percent roe recovery ± $25 per percent point above or below 10 percent to $340 per short ton ± $50 per percentage point. Most processors established 8 percent as the minimum roe recovery for herring to be purchased. At least one company, however, purchased and dumped overboard as waste, herring of less than 8 percent since there was no market for bait-food herring.

### Security Cove District:

Commercial herring fishing has been regulated by Emergency Order since 1981 to provide for a more orderly fishery and to allow for periodic reassessment of the herring biomass. The district was opened to the commercial harvest of herring on 21 May and was closed 4 June for a total fishing time of 345 hours. Total harvest was 295 mt (Table 19). Forty-seven percent of the harvest was taken on 29 May by 13 fishermen. Prior to and after this time period, the number of fishermen making deliveries ranged from 0 to 18 each day. All of the harvest was sold for sac roe. Average sac roe recovery for the season was 11.8 percent. Wastage of herring was estimated to be 10 mt. Value of harvested herring to fishermen was estimated to be $0.1 million. Four processors, one less than 1983, purchased herring (Appendix Table 24). The first processor arrived on the grounds 22 May. A total of 38 fishermen in 39 gill net vessels participated in the 1984 fishery, the lowest on record. Area residents (i.e. fishermen living in Platinum, Goodnews Bay, Quinhagak and Bethel) accounted for 16 percent of the effort and 22 percent of the harvest (Table 20).

Overall exploitation rate of herring was 6.6 percent of estimated available biomass (Appendix Table 23). Age 6 and 7 herring comprised 79 percent of total harvest. Age 4 herring represented less than 1 percent of the commercial harvest.

Although weather conditions limited assessment capabilities, management of the 1894 commercial herring fishery occurred without major problems. Fish and Wildlife Protection vessel P/V Public Safety I was on the grounds for a portion of the season. Few violations were noted.

### Goodnews Bay District:

Commercial herring fishing has been regulated by Emergency Order since 1981. The district was opened to the commercial harvest of herring on 21 May and was closed 27 May for a total fishing time of 139 hours. Total herring harvested for the season was 605 mt (Appendix Table 23).

All of the harvest was sold for sac roe. Wastage of herring was estimated at 42 mt and was attributed primarily to catches of spawn-outs. Average roe recovery was 10.1 percent. Value of harvested herring to fishermen was estimated to be $0.2 million. Four processors purchased herring (Appendix Table 24). A total of 130 fishermen in 106 gill net vessels participated in the 1984 fishery, a 35 percent increase in fishermen (Appendix Table 24). Local fishermen (i.e. residents of Platinum, Goodnews Bay, Quinhagak and Bethel) accounted for 75 percent of the effort and about 71 percent of the harvest (Table 21). Overall exploitation rate of herring was 17.5 percent of estimated available biomass (Appendix Table 23). Age 6 and 7 herring comprised 81 percent of the total harvest. Age 4 herring accounted for less than 1 percent of the harvest.

Management of the 1984 commercial herring fishery occurred without major problems. Weather conditions permitted continuous fishing and the best stock assessment since 1981. Presence of Fish and Wildlife Protection vessel P/V Public Safety I for a portion of the season enhanced efforts to enforce regulations. Few violations were noted.

Management Strategy and Procedure

Since 1981, the management strategy in both districts has been to allow no fishing until total biomass reaches 800 to 1,000 mt and spawning has started. Fishing period occurrence and length adjusted to stock strength and roe quality by Emergency Order.

The harvest in each district is based on the statewide management strategy of a 0 to 20 percent exploitation rate of estimated biomass of spawning herring. The upper end of the range is applied to stocks in good condition (large biomass, increasing abundance, good recruitment). The lower end of the range is applied to the management of smaller stocks or stocks that are exhibiting a trend of decreasing abundance or poor recruitment. The quality of the data base including the biomass estimates is also be a determining factor in choosing the appropriate exploitation rate.

The anticipated harvest level in 1984 was for a 20 percent exploitation rate. That exploitation rate was not achieved. In Security Cove, the achieved exploitation rate of 6.4 percent was due primarily to a lack of fishing effort. In Goodnews Bay, the overall exploitation rate of 17.5 percent resulted from post-season adjustments to the total biomass estimate. Herring abundance is estimated primarily by aerial surveys. Surface area estimates are made of each school and depending on water depth, a tonage figure is assigned. Tonage conversion factors are determined by capturing schools of herring with know surface areas and weighing the resulting catch. The data base for tonage conversion is updated annually from research conducted in the Togiak District. The updated tonage conversions and post-season analysis of the aerial surveys resulted in an increased biomass estimate, above that obtained in-season. The preliminary in-season biomass estimates did result in allowing a harvest of 605 mt instead of the expected harvest of 400 mt.

Surveys on 19 May found 400 mt in Goodnews Bay District and 218 mt in Security Cove District and small spawns were observed. Since the timely arrival of processors has been a problem in these districts in the past (due to their commitments in Togiak District) the Department issued a notice that the fishery was expected to open on short notice after the passing of 48 hours. Herring spawning and abundance continued to increase and both districts opened at 1400 hours 21 May, 1984. No processors were on the ground and fishermen were notified that to avoid wastage they should be sure of a market. No one began fishing until the processors began arriving that evening.

Reports from processors indicated the majority of fish were of acceptable quality. Catch rates were low enough to allow continuous fishing until Goodnews Bay District was closed on 27 May. The catch and wastage totaled 20 percent of the herring biomass estimated at that time. In the past, this district has had some problems with abandoned nets after closures. The closure at 0900 hours was announced to coincide with high tide. This may have contributed to there being no nets in the water after the closure since the tidal stage insured that both nets and boats were accessible. Security Cove was closed on 4 June, at which time there had been no fishing boats or processors in the district for 2 days.

Stock Status

Aerial surveys have been flown throughout the spawning season annually to determine relative abundance, distribution and biomass of spawning herring population in the Kuskokwim Area since 1978. Storms, fog and turbid water hampered survey coverage in the area in 1984.

Standard conversion factors of 1.2 (water depth 5 meters [m] or less), 2.5 (water depth between 5 and 8 m) and 3.0 m.t./50 m2 (water depth greater than 8 m) were used to convert estimated herring school surface areas to biomass within all districts.

Test fishing with variable mesh gill nets and sampling of commercial landings were conducted in all commercial fishing districts to determine age, size and sexual maturity of herring and to estimate occurrence and relative abundance of other schooling fishes. Additionally, gill net subsistence catch samples were obtained from the Nelson Island stocks. This information was used during post-season analysis to interpret and modify aerial survey biomass data.

Ground surveys were conducted in most districts to obtain information on the distribution and density of kelp beds and herring spawn deposition.

Security Cove District:

Twenty-four aerial surveys were flown on 16 days during the 1984 season, from 28 April to 1 June. About one-third of these surveys were made under fair to excellent conditions.

Test fishing was conducted during 5 May to 2 June. A total of 1,002 herring was sampled from these catches. Herring comprised 85 percent of the total catch of schooling fishes.

During the season, herring biomass was estimated to be 4,000 mt. A post-season estimate of 4,600 mt was obtained based on post-season aerial surveys and analysis of data from test fishing (Appendix Table 22). Age 6 and 7 herring represented 71 percent of the sampled population. Age 4 herring comprised about 1 percent of the population. A total of 13 linear km of milt was observed during aerial survey.

Goodnews Bay District:

Fifteen aerial surveys were flown on 14 days during the 1984 season, from 28 April to 1 June. Survey conditions were the best on record with about 40 percent of these surveys made under fair to excellent conditions.

Test fishing was conducted from 6 May to 2 June. A total of 719 herring was sampled from these catches. Herring comprised 70 percent of the total catch of schooling fishes. During the season, the herring biomass was estimated to be 3,300 mt. Further aerial surveys and analysis of data from test fishing resulted in a post-season biomass estimate of 3,700 mt (Appendix Table 22). Approximately 73 percent of the total biomass was composed of age 6 and 7 herring . Age 4 herring accounted for about 1 percent of the biomass. A total of 11 linear km of milt was observed during aerial surveys.

Nelson - Nunivak Islands Area:

Three aerial surveys were flown during the 1984 season on 30 May, 2 and 15 June. Survey conditions were fair to excellent on all surveys.

No test fishing was conducted in the Nelson Island area. However, a total of 594 herring was sampled from subsistence catches.

Herring biomass was estimated to be 10,000 mt for Nelson Island and 6,074 mt for Nunivak Island (Appendix Table 22). Totals of 10 and 3 linear km of milt were sighted during aerial surveys of Nelson and Nunivak Islands, respectively.

Age 6 and 7 herring comprised 78 percent of the subsistence catch.

Outlook and Management Strategy for 1985

Based upon continued large returns of the 1977 and 1978 year classes in 1984 (age 7 and 6 herring, respectively), a harvestable surplus of herring should be available in all districts during 1985. However, since methods to reliably forecast actual returns are still being developed and estimates of recruitment are not available, harvest levels will be adjusted during the season according to observed herring

biomass. If it is not possible to determine herring abundance using aerial survey methods, stock abundance will be assessed using information from test and commercial catches along with spawn deposition observations. Projections from post-season escapement estimates, using mean rates of natural mortality and growth for each age class, indicate that the 1985 spawning biomass should be 20,100 mt (18 percent lower than 1984 biomass). However, increased recruitment of ages 3 through 5 year old herring could increase this figure.

Security Cove District:

Emergency Order authority will be used to adjust the occurrence and length of fishing periods to stock strength and spawning. No fishing will be allowed until total biomass reaches 800 to 1,000 mt and spawning has started. Attempts will be made to maintain an overall harvest of 10 to 20 percent of the available biomass. Projected return is 3,600 mt. No major change in management strategy from 1984 is anticipated.

Goodnews Bay District:

Management strategy for this district will be similar to that used for Security Cove. The season will be opened by Emergency Order, a minimum total biomass of 800 to 1,000 mt will be required on the grounds prior to the first opening, harvest levels will be maintained between 10 to 20 percent of available biomass. Projected return is 2,700 mt.

Nelson-Nunivak Island Districts:

Based on the increasing size of the herring population in this area and local interest, the Board of Fisheries provided for a commercial herring fishery in two new districts; Nelson Island and Nunivak Island. The Board also passed the following policy which will be used as the management strategy in these new districts.

POLICY STATEMENT ON MANAGEMENT OF THE
NELSON ISLAND DISTRICT HERRING FISHERY

Due to the importance of subsistence utilization of herring by local residents in the Nelson Island District, special measures are necessary to insure that the subsistence priority required by state law is provided during development of the commercial herring fishery in this area. Regulations necessary for the orderly development of the commercial herring fishery in the Nelson Island District do not in any way restrict the taking of herring or other fish for subsistence purposes. In addition, 5 AAC 01.020 provides that commercial fishermen may retain fish for their subsistence use or for the subsistence use of other persons.

To provide additional protection of the subsistence herring fishery, the following guidelines are provided:

1. The commercial fishery will be allowed to take up to 10 percent of the available herring biomass, compared to up to 20 percent for most other fisheries having stocks of similar size and condition.

2. The commercial fishing season will be opened when a biomass of 1,100 to 1,700 short tons or spawning activity is documented.

3. Periodic closures of the commercial fishery will be scheduled, during which time subsistence fishing will be the only activity allowed.

4. Several important subsistence use areas occur throughout the district, including waters north of Cape Vancouver, and specific areas may be closed to commercial fishing to insure the adequacy of subsistence harvest.

5. The department will use all available means, including the input from local residents to insure the adequacy of subsistence herring harvest during the commercial fishing season.

Projected returns are 8,600 mt and 5,200 mt for the Nelson and Nunivak Islands Districts, respectively.

## HALIBUT

Pacific halibut (Hippoglossus stenolepis) are found in the marine waters off the coasts of Nelson and Nunivak Islands. Annual village subsistence harvests have not been monitored by the Division of Commercial Fisheries, however, periodic contact with these areas have shown that halibut is used for subsistence purposes by the residents of Nelson Island and Nunivak Island. There are two primary methods of harvesting these fish, jigging and longlining. The majority of both the commercial and subsistence harvest is taken by jigging with handlines.

A pilot commercial halibut fishery at Mekoryuk was conducted in 1966 by the Bureau of Indian Affairs. All the fishing took place in an area west of Cape Etolin. Ten fishermen took part in this study landing 533 halibut for a total of 8,799 pounds. This fishery was worth approximately $1,760 to the fishermen. Leonard Revet and Jeffrey Keahon authored a report on this pilot fishery and concluded that the people of Mekoryuk did not seem interested in commercial halibut fishing at this time.

No further commercial activity took place by local residents until June 1982. The Bering Sea Fishermen's Association worked as advisors in initiating a commercial halibut project, together with Nunam Kitlutsisti and the Nelson Island villages.

The halibut fishery is not managed by the State of Alaska. It is under the jurisdiction of the U.S. government through the North Pacific Management Council. However, research on stock status and promulgation of proposals for the North Pacific Halibut fishery is provided by the International Pacific Halibut Commission, who makes recommendations to the governments involved under the terms of the International Pacific Halibut Convention.

Regulatory Area 4E, all waters in the Bering Sea north of the closed area, east of 168° W. and south of 65° 34' N., includes the Nelson and Nunivak Island area. The catch for Area 4E comes from Nelson and Nunivak Island fishery in spite of the larger geographic area covered by the area.

Area 4E opened on 21 May and closed on 30 October in 1984 with alternating 2-days and 1-day closed commercial fishing periods, plus one 8-day open period at the end. A total of 35,000 pounds was caught in 1984 down slightly from the 1983 catch of 35,248 pounds (see Appendix Table 26). Nearly 90 percent of the catch was taken between the first landing on 16 June and 4 July, at which time the fishery essentially ceased though not closed by Commission action (IPHC 1984).

## WHITEFISH AND OTHER MISCELLANEOUS SPECIES

### Introduction

Several species other than salmon, herring and halibut are utilized for commercial, subsistence and recreation purposes in the Kuskokwim Area. These include inconnu (*Stenodus leucichthys*), whitefish (*Coregonus* sp. and *Prosopium* sp.), char (*Saluelinus* sp.), rainbow trout (*Salmo gairdneri*), burbot (*Lota lota*), Arctic grayling (*Thymallas arcticus*), pike (*Esox lucius*), Arctic lamprey (*Lampetra japonica*), smelt (*Osmerus* sp.), blackfish (*Dallia pectoralis*) and longnose sucker (*Catostomus catostomus*) (Appendix Table 9).

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### Subsistence Fishery

These fish are taken by set gill nets, fish traps, "jigging" through the ice and rod-and-reel. The majority of the harvest is made by subsistence fishermen. Subsistence catches taken during the spring and summer months are generally sun-dried, while catches made during the winter are stored frozen. Many of these fish are used for human consumption, but a significant percentage is fed to dogs. Subsistence harvests of these miscellaneous species are not limited by regulation.

For a more complete discussion of the subsistence utilization of these species, see Charnely, 1984. Annual subsistence harvest has not been monitored due to a lack of funding.

## Commercial Fishery

Commercial harvest of miscellaneous species is allowed under terms of a Freshwater Fishery permit. Fish taken for commercial purposes are sold locally. Two Freshwater Fisheries permits were issued in 1984 and 159 burbot were sold. Gear types used were gill net and pot.

## Status of the Stocks

The Department does not monitor the status of the freshwater species in the Kuskokwim Area. Limited Department observations, advisory committee recommendations and fishermen interviews give no indication of decling populations in most species.

There presently is some concern for whitefish populations in the lower Kuskokwim Drainage. Fishermen indicate that subsistence whitefish catches are declining. The unusually high population of beaver (Castor canadeusis) is believed by the public to be the cause. The U.S.F.W.S. Yukon Delta Refuge is presently conducting a study on the ecology of beaver and whitefish in the area. The results of this study may provide more information on the problem. The Board of Game liberalized the beaver harvest in an attempt to return the population to normal levels.

Concern has also been expressed, primarily by recreational fishermen, for rainbow trout in the area, Kwethluk and Kanektok River drainages in particular. The Board of Fisheries reduced the sport limit for this species in response to these concerns. Both the Sport Fish Division and the USFWS Togiak Refuge are conducting studies on these populations.

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Table 1. Kuskokwim Area Salmon Gillnet Specifications, 1984. 1/

| | NUMBER SOLD 2/ | MESH SIZE (inch) | THREAD SIZE | MATERIAL |
|---|---|---|---|---|
| Subtotal | 4 | 5 1/4 | 210/16 | Nylon |
| | 30 | 5 3/8 | 225/16 | Nylon |
| | 44 | 5 3/8 | 225/18 | Nylon |
| | 2 | 5 3/8 | 0.5x30 | Plastic |
| Subtotal | 76 | 5 3/8 | - | - |
| | 19 | 5 1/2 | 210/16 | Nylon |
| | 83 | 5 1/2 | 225/16 | Nylon |
| | 59 | 5 1/2 | 225/18 | Nylon |
| | 34 | 5 1/2 | 0.5x36 | Plastic |
| Subtotal | 195 | 5 1/2 | - | - |
| | 24 | 8 | 225/21 | Nylon |
| | 34 | 8 | 225/21 | Plastic |
| | 66 | 8 | 225/24 | Nylon |
| Subtotal | 121 | 8 | - | - |
| SUBTOTAL | 12 | 8 1/4 | 225/24 | Nylon |
| TOTAL | 408 | - | - | - |

1/ This data was provided by a single net distributor but is believed to be representative the nets in general use.

2/ Number of 50 fathom nets.

Table 2. Kuskokwim Area salmon entry permits issued by village, 1984.[1] (continued)

| VILLAGE | NUMBER OF ENTRY PERMITS |
|---|---|
| Akiachak | 51 |
| Akiak | 26 |
| Aniak | 11 |
| Atmauthlauk | 25 |
| Bethel | 157 |
| Chuathbaluk | 2 |
| Chefornak | 3 |
| Eek | 40 |
| Goodnews Bay | 41 |
| Kalskag | 3 |
| Kasigluk | 40 |
| Kipnuk | 13 |
| Kongiganak | 22 |
| Kwethluk | 61 |
| Kwigillingok | 17 |
| Lower Kalskag | 2 |
| McGrath | 1 |
| Napakiak | 41 |
| Napaskiak | 23 |
| Nunapitchuk | 43 |
| Oscarville | 7 |
| Platinum | 9 |
| Quinhagak | 88 |
| Sleetmute | 1 |
| Tuluksak | 25 |
| Tuntutuliak | 46 |
| Kuskokwim Area Subtotal | 798 |
| Anchorage | 7 |
| Fairbanks | 1 |
| Manakotak | 2 |

Table 2. Kuskokwim Area salmon entry permits issued by village, 1984.[1]

| VILLAGE | NUMBER OF ENTRY PERMITS |
|---|---|
| Nome | 1 |
| Togiak | 1 |
| Nonlocal Alaska residents subtotal | 13 |
| Portland, Oregon | 1 |
| Seattle, Washington | 1 |
| Nonresident subtotal | 2 |
| TOTAL | 813 |

1/ As of September 26, 1984.

Table 3. Kuskokwim Area commercial and subsistence 1/ salmon catches by species and district, 1984 (continued).

| DISTRICTS | CHINOOK | SOCKEYE | COHO 2/ | PINK | CHUM 3/ | TOTAL |
|---|---|---|---|---|---|---|
| District 1, Lower Kuskokwim River | | | | | | |
| Commercial | 29,946 | 46,571 | ~~605,098~~ 575,018 | 2,931 | 396,031 | 1,080,577 |
| Subsistence | 45,591 | - | 9,926 | - | 84,834 | 140,351 |
| SUBTOTAL | 75,537 | 46,571 | 615,024 | 2,931 | 480,865 | 1,220,928 |
| District 2, Middle Kuskokwim River | | | | | | |
| Commercial | 1,796 | 2,004 | 18,349 | 11 | 27,687 | 49,847 |
| Subsistence | 10,090 | - | 3,246 | - | 56,916 | 70,252 |
| SUBTOTAL | 11,886 | 2,004 | 21,595 | 11 | 84,603 | 120,099 |
| Upper Kuskokwim River | | | | | | |
| Commercial | CLOSED TO COMMERCIAL SALMON FISHING. | | | | | |
| Subsistence | 1,525 | | 300 | | 7,550 | 19,736 |
| SUBTOTAL | 1,525 | | 300 | | 7,550 | 19,736 |
| Kuskokwim River | | | | | | |
| Commercial | 31,742 | 48,575 | ~~623,447~~ 593,447 | 2,942 | 423,718 | 1,130,424 |
| Subsistence | 57,206 | - | 13,472 | - | 149,300 | 219,978 |
| SUBTOTAL | 88,948 | 48,575 | 636,919 | 2,942 | 573,018 | 1,350,402 |
| District 4, Quinhagak | | | | | | |
| Commercial | 33,652 | 17,258 | 135,342 | 16,249 | 50,424 | 252,925 |
| Subsistence | 3,109 | 172 | 1,490 | 129 | 589 | 5,489 |
| SUBTOTAL | 36,761 | 17,430 | 136,832 | 16,378 | 51,013 | 258,414 |
| District 5, Goodnews Bay | | | | | | |
| Commercial | 8,612 | 15,474 | 71,176 | 4,711 | 14,340 | 114,313 |
| Subsistence | 629 | 964 | 154 | 66 | 189 | 2,002 |
| SUBTOTAL | 9,241 | 16,438 | 71,330 | 4,777 | 14,529 | 116,315 |

Table 3. Kuskokwim Area commercial and subsistence 1/ salmon catches by species and district, 1984 (continued).

| DISTRICT | CHINOOK | SOCKEYE | COHO 2/ | PINK | CHUM 3/ | TOTAL |
|---|---|---|---|---|---|---|
| Kuskokwim Bay | | | | | | |
| Commercial | 42,264 | 32,732 | 206,518 | 20,960 | 64,764 | 367,238 |
| Subsistence | 3,738 | 1,136 | 1,644 | 195 | 788 | 7,491 |
| SUBTOTAL | 46,002 | 33,868 | 208,162 | 21,155 | 65,542 | 374,729 |
| Grand Total Kuskokwim Area | | | | | | |
| Commercial | 74,006 | 81,307 | ~~829,965~~ | 23,902 | 488,482 | 1,497,662 |
| Subsistence | 60,944 | 1,136 | 15,116 | 195 | 150,078 | 227,469 |
| TOTAL | 134,950 | 82,443 | 845,081 | 24,097 | 638,560 | 1,725,131 |

1/ Subsistence data is preliminary.
2/ Subsistence catch is incomplete; survey was done while fishery was in progress.
3/ Subsistence catch includes small numbers of sockeye and pink salmon.

Table 4. Average weight and average price per pound of salmon taken in the Kuskokwim Area commercial fishery, 1984. 1/

| DISTRICT NAME | DISTRICT NUMBER | AVERAGE WEIGHT BY SPECIES 2/ (AVERAGE PRICE/POUND) | | | | |
|---|---|---|---|---|---|---|
| | | CHINOOK | SOCKEYE | COHO | PINK | CHUM |
| Lower Kuskokwim River | 1 | 16.8 (0.86) | 6.5 (0.51) | 7.5 (0.51) | 3.3 (0.05) | 6.6 (0.28) |
| Middle Kuskokwim River | 2 | 15.2 (0.85) | 6.8 (0.30) | 7.2 (0.60) | 0 (0.00) | 6.7 (0.30) |
| Quinhagak | 4 | 15.4 (0.88) | 6.7 (0.54) | 8.2 (0.58) | 3.0 (0.06) | 7.4 (0.30) |
| Goodnews Bay | 5 | 19.2 (1.03) | 6.5 (0.71) | 8.7 (0.78) | 3.8 (0.13) | 7.5 (0.25) |
| AREA AVERAGE | all | 16.4 (0.89) | 6.6 (0.52) | 7.7 (0.55) | 3.2 (0.07) | 6.7 (0.28) |

1/ Data obtained from processor weights.
2/ Weight in pounds.

Table 5. Kuskokwim Area salmon processors and associated data, 1984 (continued).

| COMMERCIAL OPERATOR | PRODUCT | DISTRICT |
|---|---|---|
| Calista Emmonak Fishery<br>516 Denali Street<br>Anchorage, AK 99501<br>(907)279-5516 | Fresh Salmon | 1, 4, 5 |
| Diamond Fisheries<br>General Delivery<br>Tuluksak, AK 99679<br>(907) 695-6514 | Fresh Salmon | 1 |
| Fish Products LTD<br>Box 19<br>Aniak, AK 99557<br>(907) 834-4750 | Fresh Salmon | 2 |
| Harvest Moon Seafood<br>General Delivery<br>Platinum, AK 99561 | Fresh Salmon | 5 |
| Incorp. Fishermen/Quinhagak<br>Box 70<br>Quinhagak, AK 99655<br>(907) 556-8214 | Fresh Salmon | 4 |
| J.B. Crow and Son, Inc.<br>Box 567<br>Bethel, AK 99559<br>(907) 543-2440 | Fresh Salmon | 1, 2 |
| Kemp and Paulucci Seafoods, Inc.<br>4832 West Superior Street<br>Box 6506<br>Duluth, Minnesota 55086<br>(218)624-0062 | Fresh Salmon | 1, 2, 4, 5 |
| Patson Fisheries<br>Box 445<br>Bethel, AK 99559<br>(907) 543-3410 | Fresh Salmon | 1, 4 |
| Schenks Seafood Sales, Inc.<br>Box 984<br>Bellingham, WA 98277 | Fresh Salmon | 5 |

Table 5. Kuskokwim Area salmon processors and associated data, 1984 (continued).

| COMMERCIAL OPERATOR | PRODUCT | DISTRICT |
|---|---|---|
| Sea Fisher Products, Inc.<br>Box 8<br>Petersburg, AK 99833<br>(907)486-3147 | Fresh Salmon | 5 |
| Swanson's<br>EDSA Enterprises, Inc.<br>Box 478<br>Bethel, AK 99559 | Freshwater | 1 |
| Ted Solomon Fisheries<br>Box 1567<br>Harvre, Montana 59501<br>(907)438-2618 406-395-4404 | Fresh Salmon | 5 |
| Y.K. Fisheries<br>General Delivery<br>Kalskag, Alaska<br>(907) 438-2618 | Fresh Salmon | 2 |

Table 6. Kuskokwim Area salmon fishery emergency orders, 1984 (continued).

| EMERGENCY ORDER NO. | DATE | ACTION TAKEN | JUSTIFICATION |
|---|---|---|---|
| 01 | 14 June | Opened the commercial salmon fishing season in Districts 1, 4 and 5 and established the first commercial fishing period in those districts on June 18. | Chinook salmon present in sufficient numbers. |
| 02 | 20 June | Open the commercial salmon fishing season in District 2 and established a commercial fishing period in Districts 1 and 2 on June 21. | Chinook salmon present in sufficient numbers. |
| 03 | 20 June | Established a commercial salmon fishing schedule in Districts 4 and 5 effective June 21 of twice weekly fishing periods from 6:00 p.m. Monday until 6:00 a.m. Tuesday and from 6:00 p.m. Thursday until 6:00 a.m. Friday. | Chinook salmon present in sufficient numbers. |
| 04 | 23 June | Established commercial fishing period in Districts 1 and 2 from 6:00 p.m. until midnight, June 25. | Chinook salmon present in increasing numbers. |
| 05 | 23 June | Required that salmon may be taken only with gillnets of six-inch or smaller mesh in Districts 1 and 2 on June 25. | Sockeye and chum salmon present in sufficient numbers. |
| 06 | 23 June | Reduced the size of commercial fishing District 1 to that area from Bethel | Advanced the effective date of regulation 5AAC 07.350. (2). |

Table 6. Kuskokwim Area salmon fishery emergency order, 1984 (continued).

| EMERGENCY ORDER NO. | DATE | ACTION TAKEN | JUSTIFICATION |
|---|---|---|---|
| 06 | 23 June | downstream to the north end of Eek Island. | |
| 07 | 23 June | Established a subsistence closure of 24 hours before, during and for six hours after each open commercial salmon fishing period in District 1. | Advanced the effective date of regulation 5AAC 97.331. |
| 08 | 26 June | Established commercial fishing period in District 2 from 6:00 p.m. until midnight, June 28. | Sockeye and chum salmon present in increasing numbers. |
| 09 | 30 June | Established commercial fishing period in District 2 from 6:00 p.m. until midnight, July 2. | Sockeye and chum salmon present in increasing numbers. |
| 10 | 10 July | Continued the fishing season and increased the commercial fishing time in District 4 from two 12 hour periods per week to three 12 hour periods per week, from 6:00 a.m. to 6:00 p.m. Monday, Wednesday and Friday effective July 11. | Sockeye and chum salmon present in sufficient numbers. Chinook salmon migration complete. |
| 11 | 16 July | Continued the fishing season in District 5 from two nighttime 12 hour periods per week to two daytime 12 hour periods per week from 6:00 a.m. to 6:00 p.m. Monday and Friday effective July 16. | Sockeye and chum salmon present in sufficient numbers and fisherman safety. |

Table 6. Kuskokwim Area salmon fishery emergency order, 1984 (continued).

| EMERGENCY ORDER NO. | DATE | ACTION TAKEN | JUSTIFICATION |
|---|---|---|---|
| 12 | 17 July | Closed the commercial salmon fishing season in District 1 of the Kuskokwim River (Bethel to north end of Eek Island) effective July 19 until further notice. | Declining test catches and commercial catches and declining escapements remaining salmon were needed for escapement. |
| 13 | 23 July | Continued the fishing season and increased the commercial fishing time in District 5 from two 12 hour periods per week to three 12 hour periods per week, from 6:00 a.m. to 6:00 p.m. Monday, Wednesday and Friday effective July 23. | Sockeye and chum salmon escapement in sufficient numbers. |
| 14 | 26 July | Opened commercial coho salmon season in District 1 of the Kuskokwim River (Mishevik Slough to north end of Eek Island) and established two six hour commercial fishing periods per week from 9:00 a.m. to 3:00 p.m. Monday and Thursday effective July 29. | The majority of chinook, sockeye and chum salmon have passed through District 1. Coho salmon present in sufficient numbers. |
| 15 | 27 July | Established a subsistence closure of 15 hour before, during and for six hours after each open commercial fishing period in District 1. | Advanced the effective day of regulation 5AAC 01.260. |

Table 6. Kuskokwim Area salmon fishery emergency order, 1984 (continued).

| EMERGENCY ORDER NO. | DATE | ACTION TAKEN | JUSTIFICATION |
|---|---|---|---|
| 16 | 06 August | Continued the fishing season and increased commercial fishing time in District 1 from two 6 hour periods per week to two 9 hours periods per week from 9:00 a.m. to 6:00 p.m. Monday and Thursday effective August 6. | Coho salmon continue in increasing numbers. |
| 17 | 31 August | Continued the fishing season and decreasing the commercial fishing time in District 1 from two 9 hour periods per week to two 6 hour periods per week from 9:00 a.m. to 6:00 p.m. Monday and Thursday effective September 2. | To insure that the escapement requirements of the late run coho salmon are met. |

Table 7. Kuskokwim River Subsistence Fishing Households.

| VILLAGE | 1978 | 1979 | 1980 | 1981 | 1982 | 5 YEAR AVRG. |
|---|---|---|---|---|---|---|
| Kwigillingok | 3 | - | - | - | 1 | 2 |
| Kongigonak | - | - | - | - | 29 | 29 |
| Kipnuk | - | - | - | - | 22 | 22 |
| Eek | 29 | 33 | 34 | 28 | 29 | 31 |
| Tuntutuliak | 32 | 34 | 35 | 15 | 22 | 28 |
| Kasigluk | 24 | 38 | 39 | 31 | 40 | 34 |
| Nunapitchuk | 32 | 35 | 40 | 27 | 40 | 34 |
| Atmautluak | 28 | 25 | 29 | 17 | 31 | 26 |
| Napakiak | 45 | 40 | 43 | 37 | 31 | 31 |
| Oscarville | 9 | 8 | 8 | 2 | 9 | 7 |
| Napaskiak | 35 | 33 | 35 | 23 | 27 | 31 |
| Bethel | 174 | 236 | 205 | 151 | 141 | 181 |
| Kwethluk | 59 | 66 | 67 | 46 | 57 | 59 |
| Akiachak | 44 | 48 | 51 | 28 | 38 | 47 |
| Akiak | 25 | 27 | 25 | 22 | 29 | 26 |
| Tuluksak | 28 1/ | 29 1/ | 27 1/ | 23 1/ | 24 1/ | 26 |
| Lower Kalskag | 28 | 31 | 31 | 20 | 24 | 27 |
| Upper Kalskag | 16 | 19 | 16 | 12 | 14 | 15 |
| Aniak | 26 | 42 | 40 | 35 | 40 | 37 |
| Chauthbaluk | 12 | 12 | 14 | 11 | 15 | 13 |
| Napamute | 3 | 3 | 2 | 2 | 3 | 3 |
| Crooked Creek | 14 | 12 | 18 | 16 | 14 | 15 |
| Red Devil | 4 | 11 | 8 | 7 | 8 | 8 |
| Sleetmute | 9 | 9 | 12 | 20 | 14 | 13 |
| Sleetmute-Holitna | 11 | 10 | 11 | - | - | 11 |
| Stony River | 8 | 9 | 7 | 6 | 9 | 8 |
| Lime Village | - | 5 | - | - | - | 5 |
| Deacon's Landing | - | 1 | - | - | - | 1 |
| McGrath | - | 18 | - | - | 7 | 13 |
| Takotna | - | 3 | - | - | - | 3 |
| Nikolai | - | 9 | - | 21 | 24 | 18 |
| Telida | - | 4 | - | - | - | 4 |
| TOTAL KUSKOKWIM RIVER | 689 | 850 | 797 | 583 | 742 | 734* |
| Quinhagak | 65 1/ | 48 1/ | 76 1/ | 59 3/ | 52 | 60 |
| Platinum | - | 6 | 11 | 4 | 5 | 7 |
| Goodnews Bay | - | 15 | 44 | 13 | 17 | 22 |

*All years do not include all villages
1/ Expanded
2/ Unexpanded
3/ 1985 AMR reports 53, 56 and 59 but used 59 in the 1982 historical table. Only 1981 and 1982 have unexpanded numbers for the lower river villages.

Table 8. Reported, estimated and total subsistence harvest of Kuskokwim River salmon by species in sampled villages, 1983 (continued).

| | REPORTED | | | | | ESTIMATED | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NUMBER OF FISHING HOUSEHOLDS | RETURNED CALENDER | HARVEST 1/ CHINOOK | OTHER 2/ | COHO 3/ | NUMBER OF FISHING HOUSEHOLDS | AVG REPORTED CATCH/HOUSEHOLD CHINOOK | OTHER | HARVEST CHINOOK | OTHER |
| Tuntutuliak | 23 | 0 | 2,889 | 4,193 | 696 | 5 | 126 | 182 | 630 | 910 |
| Bethel | 114 | 2 | 7,101 | 12,103 | 4,995 | 65 | 61 | 104 | 3,965 | 6,760 |
| Kwethluk | 21 | 1 | 2,514 | 5,414 | 1,639 | 37 | 114 | 246 | 4,218 | 9,102 |
| Akiachak | 27 | 1 | 3,327 | 7,875 | 2,135 | 19 | 119 | 281 | 2,261 | 5,339 |
| Akiak | 16 | 1 | 2,234 | 5,246 | 461 | 9 | 131 | 309 | 1,179 | 2,781 |
| LOWER RIVER TOTALS | 201 | 5 | 18,065 | 34,831 | 9,926 | 135 | N/A | N/A | 12,253 | 24,892 |
| Tuluksak 4/ | 26 | 0 | 2,286 | 9,407 | 196 | - | - | - | - | - |
| Lower Kalskag | 7 | 1 | 962 | 2,635 | 150 | 19 | 120 | 329 | 2,280 | 6,251 |
| Upper Kalskag | 9 | 0 | 393 | 1,542 | 72 | 6 | 44 | 171 | 264 | 1,026 |
| Aniak | 34 | 1 | 1,747 | 8,371 | 2,825 | 2 | 50 | 239 | 100 | 478 |
| MIDDLE RIVER TOTALS | 76 | 2 | 5,388 | 21,955 | 3,246 | 27 | N/A | N/A | 2,644 | 7,755 |
| Sleetmute 5/ | 13 | 1 | 154 | 2,208 | 411 | - | - | - | - | - |
| Nicolai 4/ | 28 | NA | 795 | 5,100 | 200 | - | - | - | - | - |
| McGrath 4/ | 27 | NA | 730 | 2,450 | NOT COLLECTED | - | - | - | - | - |
| Telida 4/ | 6 | NA | - | - | 100 | - | - | - | - | - |
| UPPER RIVER TOTALS | 72 | 1 | 1,679 | 9,758 | 711 | - | - | - | - | - |
| KUSKOKWIM RIVER TOTALS | 349 | 8 | 25,132 | 66,544 | 13,883 | 162 | | | 14,897 | 32,647 |

Table 8. Reported, estimated and total subsistence harvest of Kuskokwim River salmon by species in sampled villages, 1983 (continued).

| VILLAGE | NUMBER OF FISHING HOUSEHOLDS | CHINOOK | OTHER 2/ |
|---|---|---|---|
| Tuntutuliak | 28 | 3,519 | 1,146 |
| Bethel | 181 | 11,066 | 18,863 |
| Kwethluk | 59 | 6,732 | 14,516 |
| Akiachak | 47 | 5,588 | 13,214 |
| Akiak | | 3,613 | 8,027 |
| LOWER RIVER TOTALS | 341 | 30,318 | 59,723 |
| Tuluksak 4/ | - | 2,286 | 9,407 |
| Lower Kalskag | 27 | 3,242 | 8,886 |
| Upper Kalskag | 15 | 657 | 2,568 |
| Aniak | 37 | 1,847 | 8,849 |
| MIDDLE RIVER TOTALS | 79 | 8,032 | 29,710 |
| Sleetmute 5/ | 14 | 154 | 2,208 |
| Nicolai 4/ | - | 795 | 5,100 |
| McGrath 4/ | 0 | 730 | 2,450 |
| Telida 4/ | - | - | - |
| UPPER RIVER TOTALS | 14 | 1,679 | 9,758 |
| KUSKOKWIM RIVER TOTALS | 434 | 40,029 | 99,191 |

1/ Includes data from households which returned calendars, but were not interviewed.
2/ Primarily chum salmon, but includes small numbers of sockeye and pink salmon.
3/ Survey done before coho salmon fishing had ceased.
4/ Complete census taken, no data expansion necessary
5/ Expansion not possible due to interviewing more fishing households than the previous five year average.

Table 9. Reported, estimated and total subsistence harvests of Kuskokwim River salmon by species in sampled villages, 1984 (continued).

| | REPORTED | | | | | ESTIMATED | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NUMBER OF FISHING HOUSEHOLDS | RETURNED CALENDER | HARVEST 1/ CHINOOK | HARVEST 1/ OTHER 2/ | HARVEST 1/ COHO 3/ | NUMBER OF FISHING HOUSEHOLDS | AVG REPORTED CATCH/HOUSEHOLD CHINOOK | AVG REPORTED CATCH/HOUSEHOLD OTHER | HARVEST CHINOOK | HARVEST OTHER |
| Tuntutuliak | 23 | 0 | 2,889 | 4,193 | 696 | 5 | 126 | 182 | 630 | 910 |
| Bethel | 114 | 2 | 7,101 | 12,103 | 4,995 | 65 | 61 | 104 | 3,965 | 6,760 |
| Kwethluk | 21 | 1 | 2,514 | 5,414 | 1,639 | 37 | 114 | 246 | 4,218 | 9,102 |
| Akiachak | 27 | 1 | 3,327 | 7,875 | 2,135 | 19 | 119 | 281 | 2,261 | 5,339 |
| Akiak | 16 | 1 | 2,234 | 5,246 | 461 | 9 | 131 | 309 | 1,179 | 2,781 |
| LOWER RIVER TOTALS | 201 | 5 | 18,065 | 34,831 | 9,926 | 135 | N/A | N/A | 12,253 | 24,892 |
| Tuluksak 4/ | 26 | 0 | 2,286 | 9,407 | 196 | - | - | - | - | - |
| Lower Kalskag | 7 | 1 | 962 | 2,635 | 150 | 19 | 120 | 329 | 2,280 | 6,251 |
| Upper Kalskag | 9 | 0 | 393 | 1,542 | 72 | 6 | 44 | 171 | 264 | 1,026 |
| Aniak | 34 | 1 | 1,747 | 8,371 | 2,825 | 2 | 50 | 239 | 100 | 478 |
| MIDDLE RIVER TOTALS | 76 | 2 | 5,388 | 21,955 | 3,246 | 27 | N/A | N/A | 2,644 | 7,755 |
| Sleetmute 5/ | 13 | 1 | 154 | 2,208 | 411 | - | - | - | - | - |
| Nicolai 4/ | 28 | NA | 795 | 5,100 | 200 | - | - | - | - | - |
| McGrath 4/ | 27 | NA | 730 | 2,450 | NOT COLLECTED | - | - | - | - | - |
| Telida 4/ | 6 | NA | - | - | 100 | - | - | - | - | - |
| UPPER RIVER TOTALS | 72 | 1 | 1,679 | 9,758 | 711 | - | - | - | - | - |
| KUSKOKWIM RIVER TOTALS | 349 | 8 | 25,132 | 66,544 | 13,883 | 162 | | | 14,897 | 32,647 |

Table 9. Reported, estimated and total subsistence harvest of Kuskokwim River salmon by species in sampled villages, 1984 (continued).

| VILLAGE | NUMBER OF FISHING HOUSEHOLDS | TOTAL CHINOOK | TOTAL OTHER 2/ |
|---|---|---|---|
| Tuntutuliak | 28 | 3,519 | 1,146 |
| Bethel | 181 | 11,066 | 18,863 |
| Kwethluk | 59 | 6,732 | 14,516 |
| Akiachak | 47 | 5,588 | 13,214 |
| Akiak | 26 | 3,413 | 8,027 |
| LOWER RIVER TOTALS | 341 | 30,318 | 59,723 |
| Tuluksak 4/ | - | 2,286 | 9,407 |
| Lower Kalskag | 27 | 3,242 | 8,886 |
| Upper Kalskag | 15 | 657 | 2,568 |
| Aniak | 37 | 1,847 | 8,849 |
| MIDDLE RIVER TOTALS | 79 | 8,032 | 29,710 |
| Sleetmute 5/ | 14 | 154 | 2,208 |
| Nicolai 4/ | - | 795 | 5,100 |
| McGrath 4/ | 0 | 730 | 2,450 |
| Telida 4/ | - | - | - |
| UPPER RIVER TOTALS | 14 | 1,679 | 9,758 |
| KUSKOKWIM RIVER TOTALS | 434 | 40,029 | 99,191 |

1/ Includes data from households which returned calendars, but were not interviewed.
2/ Primarily chum salmon, but includes small numbers of sockeye and pink salmon.
3/ Survey done before coho salmon fishing had ceased.
4 omplete census taken, no data expansion necessa
5 ansion not possible due to interviewing more ng households than the previous five year av

Table 10. Estimated total subsistence salmon harvest from Kuskokwim River, 1983. 1/

| LOCATION OF HARVEST | TOTAL HARVEST IN SAMPLED VILLAGES 2/ | | | PERCENT OF SUBSISTENCE HARVEST TAKEN BY SAMPLED VILLAGES 3/ | | | TOTAL ESTIMATED HARVEST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Chinook | Other 4/ | coho 5/ | Chinook | Other 4/ | coho 5/ | Chinook | Other 4/ | Coho 5/ |
| Lower River | 17,790 | 35,860 | 1,848 | 0.534 | 0.513 | 5/ | 33,315 | 69,903 | 1,848 |
| Middle and Upper River | 4,845 | 17,781 | 304 | 0.404 | 0.323 | 5/ | 11,993 | 55,049 | 304 |
| McGrath, Takotna, Nicolai, Telida 5/ | 1,580 | 5,550 | 770 | 5/ | 5/ | 5/ | 1,580 | 5,550 | 770 |
| Kuskokwim River Totals | 24,215 | 59,191 | 2,922 | | | | 46,888 | 130,502 | 2,922 |

1/ Preliminary figures, see preface.
2/ From Table 8.
3/ From Tables 12 and 13.
4/ Primarily chum salmon, but includes small numbers of other salmon.
5/ Reported catch only insufficient data to estimate total catch.

Table 11. Estimated total subsistence salmon harvest from Kuskokwim River, 1984 1/.

| LOCATION OF HARVEST | TOTAL HARVEST IN SAMPLED VILLAGES 2/ | | | PERCENT OF SUBSISTENCE HARVEST TAKEN BY SAMPLED VILLAGES 3/ | | | TOTAL ESTIMATED HARVEST | | |
|---|---|---|---|---|---|---|---|---|---|
| | Chinook | Other 4/ | coho 5/ | Chinook | Other 4/ | coho 5/ | Chinook | Other 4/ | Coho 5/ |
| Lower River | 30,318 | 59,723 | 9,926 | 0.665 | 0.704 | 5/ | 45,591 | 84,834 | 9,926 |
| Middle and Upper River | 8,032 | 29,710 | 3,246 | 0.796 | 0.522 | 5/ | 10,090 | 56,916 | 3,246 |
| McGrath, Telida and Nikolai 5/ | 1,525 | 7,550 | 300 | 5/ | 5/ | 5/ | 1,525 | 7,550 | 300 |
| Total Kuskokwim River Harvest | 39,875 | 96,983 | 13,742 | | | | 57,206 | 149,300 | 13,472 |

1/ Preliminary figures, see preface.
2/ From Table 9.
3/ From Tables 12 and 13.
4/ Primarily chum salmon, but includes small numbers of other salmon.
5/ Reported catch only insufficient data to estimate total catch.

Table 12. Kuskokwim River subsistence chinook salmon catch and percent by village, 1980-1982.

| VILLAGE | 1980 CATCH | 1980 % | 1981 CATCH | 1981 % | 1982 CATCH | 1982 % | AVE. % |
|---|---|---|---|---|---|---|---|
| LOWER RIVER: | | | | | | | |
| Kongiganak, Kipnik and Kwigillingok | 0 | 0.0 | 0 | 0.0 | 112 | 0.2 | 0.1 |
| Eek | 1,557 | 3.5 | 1,731 | 3.7 | 2,578 | 5.7 | 4.3 |
| Tuntutuliak | 2,545 | 5.7 | 4,466 | 9.5 | 1,984 | 4.3 | 6.5 |
| Kasigluk | 1,704 | 3.8 | 3,377 | 7.2 | 3,115 | 6.8 | 5.9 |
| Nunapitchuk | 2,612 | 5.8 | 2,918 | 6.2 | 2,577 | 5.7 | 5.9 |
| Atmauthlauk | 1,288 | 2.9 | 1,247 | 2.6 | 1,752 | 3.8 | 3.1 |
| Napakiak | 2,582 | 5.7 | 3,017 | 6.4 | 3,500 | 7.7 | 6.6 |
| Oscarville | 477 | 1.1 | 492 | 1.0 | 523 | 1.1 | 1.1 |
| Napaskiak | 3,160 | 7.0 | 2,911 | 6.2 | 2,872 | 6.3 | 6.5 |
| Bethel | 12,591 | 28.0 | 15,367 | 32.6 | 13,526 | 29.7 | 30.1 |
| Kwethluk | 7,627 | 17.0 | 6,167 | 13.1 | 5,897 | 12.9 | 14.3 |
| Akiachak | 5,405 | 12.0 | 3,094 | 6.5 | 4,468 | 9.8 | 9.4 |
| Akiak | 3,355 | 7.6 | 2,380 | 5.0 | 2,745 | 6.0 | 6.2 |
| SUBTOTALS | 44,903 | 100.0 | 47,167 | 100.0 | 45,639 | 100.0 | 100.0 |
| UPPER RIVER: | | | | | | | |
| Tuluksak | 2,807 | 19.3 | 2,446 | 19.3 | 2,220 | 20.3 | 19.6 |
| Lower Kalskag | 3,917 | 27.0 | 3,271 | 25.9 | 2,594 | 23.8 | 25.6 |
| Upper Kalskag | 1,889 | 13.0 | 1,171 | 9.3 | 963 | 8.8 | 10.4 |
| Aniak | 2,750 | 18.9 | 3,102 | 24.5 | 2,071 | 19.0 | 20.8 |
| Chuathbaluk | 1,507 | 10.4 | 841 | 6.6 | 1,491 | 13.6 | 10.2 |
| Napamute | 90 | 0.6 | 45 | 0.4 | 138 | 1.3 | 0.8 |
| Crooked Creel | 654 | 4.5 | 512 | 4.0 | 515 | 4.7 | 4.4 |
| Georgetown | 93 | 0.6 | 0 | 0.0 | 0 | 0.0 | 0.2 |
| Red Devil | 255 | 1.8 | 298 | 2.4 | 273 | 2.5 | 2.2 |
| Sleetmute | 227 | 1.6 | 728 | 5.8 | 242 | 2.2 | 3.2 |
| Stony River | 332 | 2.3 | 233 | 1.8 | 419 | 3.8 | 2.6 |
| SUBTOTALS | 14,521 | 100.0 | 12,647 | 100.0 | 10,926 | 100.0 | 100.0 |
| TOTALS | 59,424 | | 59,814 | | 56,565 | | |

Table 13. Kuskokwim River subsistence other salmon catch and percent by village, 1980–1982.

| VILLAGE | 1980 CATCH | 1980 % | 1981 CATCH | 1981 % | 1982 CATCH | 1982 % | AVE. % |
|---|---|---|---|---|---|---|---|
| LOWER RIVER | | | | | | | |
| Kongiganak, Kipnuk and Kwigillingok | 0 | 0.0 | 0 | 0.0 | 486 | 0.4 | 0.1 |
| Eek | 2,177 | 1.7 | 1,517 | 1.4 | 1,012 | 0.8 | 1.3 |
| Tuntutuliak | 8,961 | 7.0 | 5,943 | 5.5 | 8,500 | 6.6 | 6.3 |
| Kasigluk | 5,684 | 4.4 | 3,144 | 2.9 | 6,846 | 5.4 | 4.2 |
| Nunapitchuk | 6,626 | 5.2 | 5,501 | 5.1 | 8,646 | 6.7 | 5.7 |
| Atmauthluak | 4,794 | 3.7 | 3,856 | 3.6 | 4,786 | 3.7 | 3.7 |
| Napakiak | 8,123 | 6.3 | 7,099 | 6.5 | 8,618 | 6.7 | 6.5 |
| Oscarville | 1,395 | 1.1 | 1,260 | 1.2 | 1,665 | 1.3 | 1.2 |
| Napaskiak | 7,391 | 5.7 | 7,653 | 7.0 | 10,139 | 7.9 | 6.9 |
| Bethel | 33,198 | 25.8 | 42,798 | 39.4 | 27,857 | 29.4 | 31.5 |
| Kwethluk | 24,564 | 19.1 | 11,506 | 10.6 | 16,837 | 13.1 | 14.3 |
| Akiachak | 15,172 | 11.8 | 6,533 | 6.0 | 13,803 | 10.7 | 9.5 |
| Akiak | 10,596 | 8.2 | 11,718 | 10.8 | 9,339 | 7.3 | 8.8 |
| SUBTOTALS | 128,681 | 100.0 | 108,528 | 100.0 | 128,565 | 100.0 | 100.0 |
| MIDDLE AND UPPER RIVER | | | | | | | |
| Tuluksak | 9,963 | 13.4 | 6,763 | 10.0 | 5,040 | 8.7 | 10.7 |
| Lower Kalskag | 8,903 | 12.0 | 4,625 | 6.9 | 6,925 | 12.0 | 10.3 |
| Upper Kalskag | 6,932 | 9.3 | 6,916 | 10.3 | 5,362 | 9.3 | 9.6 |
| Aniak | 14,067 | 18.9 | 13,494 | 20.0 | 14,946 | 25.9 | 21.6 |
| Chauthbaluk | 4,148 | 5.6 | 8,567 | 12.7 | 6,952 | 12.0 | 10.1 |
| Napamute | 3,049 | 4.1 | 740 | 1.1 | 2,392 | 4.1 | 3.1 |
| Crooked Creek | 7,165 | 9.7 | 7,985 | 11.8 | 3,622 | 6.3 | 9.3 |
| Georgetown | 1,042 | 1.4 | 0 | 0.0 | 0 | 0.0 | 0.5 |
| Red Devil | 5,133 | 6.9 | 6,183 | 9.2 | 7,380 | 12.8 | 9.6 |
| Sleetmute | 10,934 | 14.7 | 9,805 | 14.6 | 2,936 | 5.1 | 11.5 |
| Stony River | 2,967 | 4.0 | 2,303 | 3.4 | 2,198 | 3.8 | 3.7 |
| SUBTOTALS | 74,303 | 100.0 | 67,381 | 100.0 | 57,753 | 100.0 | 100.0 |
| TOTALS | 202,984 | | 175,909 | | 186,318 | | |

Table 14. Final Season Summary for District W-1, Lower Kuskokwim

| | DATES | HOURS FISHED | NO. OF FISHER-MEN | PERIOD CATCH AND CATCH PER UNIT EFFORT CHINOOK | CPUE | SOCKEYE | CPUE | COHO | CPUE | PINK | CPUE | CHUM | CPUE CHUM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/18-6/18 | 6 | 484 | 10,845 | 3.73 | 409 | 0.14 | 0 | 0.00 | 0 | 0.00 | 5,803 | 2.00 |
| 2 | 6/21-6/21 | 6 | 443 | 6,336 | 2.38 | 2,618 | 0.98 | 0 | 0.00 | 4 | 0.00 | 22,094 | 8.31 |
| Large Mesh/Chinook Season | | 520 | | 17,181 | | 3,027 | | 0 | | 4 | | 27,897 | |
| 3 | 6/25-6/25 | 6 | 466 | 3,018 | 1.08 | 10,743 | 3.84 | 0 | 0.00 | 12 | 0.00 | 19,773 | 32.82 |
| 4 | 6/28-6/28 | 6 | 470 | 2,625 | 0.93 | 10,942 | 3.88 | 0 | 0.00 | 55 | 0.02 | 67,120 | 23.80 |
| 5 | 7/02-7/02 | 6 | 483 | 1,988 | 0.69 | 8,145 | 2.81 | 0 | 0.00 | 249 | 0.09 | 69,897 | 24.12 |
| 6 | 7/05-7/05 | 6 | 426 | 1,218 | 0.48 | 6,798 | 2.66 | 1 | 0.00 | 188 | 0.07 | 54,981 | 21.51 |
| 7 | 7/09-7/09 | 6 | 496 | 1,211 | 0.41 | 2,821 | 0.95 | 52 | 0.02 | 264 | 0.09 | 36,440 | 12.24 |
| 8 | 7/12-7/12 | 6 | 436 | 858 | 0.33 | 2,188 | 0.84 | 196 | 0.07 | 363 | 0.14 | 24,269 | 9.28 |
| 9 | 7/16-7/16 | 6 | 373 | 744 | 0.33 | 1,121 | 0.50 | 619 | 0.28 | 599 | 0.27 | 18,613 | 8.32 |
| Small Mesh/Chum Season | | 587 | | 11,662 | | 42,758 | | 868 | | 1,730 | | ~~363,093~~ 291,093 | ~~24,093~~ |
| 10 | 7/30-7/30 | 6 | 459 | 351 | 0.13 | 281 | 0.10 | 56,609 | 20.56 | 333 | 0.12 | 2,329 | 0.85 |
| 11 | 8/02-8/02 | 6 | 401 | 291 | 0.12 | 157 | 0.07 | 49,240 | 32.93 | 201 | 0.08 | 1,184 | 0.49 |
| 12 | 8/06-8/06 | 9 | 542 | 106 | 0.02 | 113 | 0.02 | 84,406 | 17.30 | 263 | 0.05 | 639 | 0.13 |
| 13 | 8/09-8/09 | 9 | 523 | 106 | 0.02 | 111 | 0.02 | 80,990 | 17.21 | 177 | 0.04 | 373 | 0.08 |
| 14 | 8/13-8/13 | 9 | 504 | 81 | 0.02 | 67 | 0.01 | 80,268 | 17.70 | 60 | 0.01 | 235 | 0.05 |
| 15 | 8/16-8/16 | 9 | 502 | 50 | 0.01 | 29 | 0.01 | 78,342 | 17.34 | 62 | 0.01 | 131 | 0.03 |
| 16 | 8/20-8/20 | 9 | 491 | 33 | 0.01 | 14 | 0.00 | 63,829 | 14.44 | 31 | 0.01 | 59 | 0.01 |
| 17 | 8/23-8/23 | 9 | 481 | 21 | 0.00 | 11 | 0.00 | 49,372 | 11.40 | 26 | 0.01 | 63 | 0.01 |
| 18 | 8/27-8/27 | 9 | 350 | 53 | 0.02 | 2 | 0.00 | 16,472 | 5.23 | 33 | 0.01 | 18 | 0.01 |
| 19 | 8/30-8/30 | 9 | 210 | 9 | 0.00 | 1 | 0.00 | 11,222 | 5.94 | 11 | 0.01 | 5 | 0.00 |
| 20 | 9/03-9/03 | 6 | 60 | 2 | 0.01 | 0 | 0.00 | 1,603 | 4.45 | 0 | 0.00 | 5 | 0.01 |
| 21 | 9/06-9/06 | 6 | 39 | 0 | 0.00 | 0 | 0.00 | 1,877 | 8.02 | 0 | 0.00 | 0 | 0.00 |
| Coho Season | | 619 | | 1,103 | | 786 | | 604,230 | | 1,197 | | 5,041 | |
| SEASON TOTAL | | 654 | | 29,946 | | 46,571 | | 575,098 ~~605,098~~ | | 2,931 | | 324,031 ~~306,031~~ | |

Table 15. Final Season Summary for District 2, middle Kuskokwim.

| | DATES | HOURS FISHED | NO. OF FISHER-MEN | PERIOD CATCH AND CATCH PER UNIT EFFORT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CHINOOK | CPUE | SOCKEYE | CPUE | COHO | CPUE | PINK | CPUE | CHUM | CPUE |
| 1 | 6/21-6/21 | 6 | 15 | 561 | 6.23 | 84 | 0.93 | 0 | 0.00 | 0 | 0.00 | 967 | 10.74 |
| Large Mesh/Chinook Season | | | 15 | 561 | | 84 | | 0 | | 0 | | 967 | |
| 2 | 6/25-6/25 | 6 | 25 | 493 | 3.29 | 543 | 3.62 | 0 | 0.00 | 0 | 0.00 | 5,705 | 38.05 |
| 3 | 6/28-6/28 | 6 | 33 | 524 | 2.65 | 395 | 1.99 | 0 | 0.00 | 0 | 0.00 | 13,376 | 67.56 |
| 4 | 7/02-7/02 | 6 | 25 | 204 | 1.36 | 982 | 6.55 | 0 | 0.00 | 11 | 0.07 | 7,420 | 49.47 |
| Small Mesh/Chum Season | | | 49 | 1,221 | | 1,920 | | 0 | | 11 | | 26,501 | |
| 5 | 8/06-8/06 | 6 | 16 | 9 | 0.09 | 0 | 0.00 | 4,339 | 45.20 | 0 | 0.00 | 110 | 1.15 |
| 6 | 8/09-8/09 | 6 | 11 | 1 | 0.02 | 0 | 0.00 | 4,340 | 65.76 | 0 | 0.00 | 69 | 1.05 |
| 7 | 8/13-8/13 | 6 | 12 | 1 | 0.01 | 0 | 0.00 | 2,792 | 38.78 | 0 | 0.00 | 24 | 0.33 |
| 8 | 8/16-8/16 | 6 | 17 | 1 | 0.01 | 0 | 0.00 | 3,652 | 35.80 | 0 | 0.00 | 16 | 0.16 |
| 9 | 8/20-8/20 | 6 | 13 | 1 | 0.01 | 0 | 0.00 | 2,179 | 27.94 | 0 | 0.00 | 0 | 0.00 |
| 10 | 8/23-8/23 | 6 | 8 | 0 | 0.00 | 0 | 0.00 | 1,047 | 21.81 | 0 | 0.00 | 0 | 0.00 |
| 11 | 8/27-8/27 | | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 12 | 8/30-8/30 | | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Coho Season | | 58 | 32 | 13 | | 0 | | 18,349 | 39.2 | 0 | | 219 | |
| SEASON TOTAL | | | | 1,796 | | 2,004 | | 18,349 | | 11 | | 27,687 | |

Table 16. Final Season Summary for District 4, Quinhagak.

| | PERIOD DATES | HOURS FISHED | FISH-MEN | PERIOD CATCH AND CATCH PER UNIT EFFORT CHINOOK | CPUE | SOCKEYE | CPUE | COHO | CPUE | PINK | CPUE | CHUM | CPUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/18-6/19 | 12 | 140 | 11,997 | 7.14 | 435 | 0.26 | 0 | 0.00 | 7 | 0.00 | 1,809 | 1.08 |
| 2 | 6/21-6-22 | 12 | 164 | 5,458 | 2.77 | 1,336 | 0.68 | 0 | 0.00 | 13 | 0.01 | 4,471 | 2.27 |
| 3 | 6/25-6/26 | 12 | 99 | 4,122 | 3.46 | 1,640 | 1.38 | 0 | 0.00 | 18 | 0.02 | 5,417 | 5.46 |
| 4 | 6/28-6/29 | 12 | 101 | 3,283 | 2.71 | 1,967 | 1.62 | 0 | 0.00 | 53 | 0.04 | 4,702 | 3.88 |
| 5 | 7/02-7/03 | 12 | 70 | 1,902 | 2.26 | 1,577 | 1.88 | 1 | 0.00 | 50 | 0.06 | 6,034 | 7.18 |
| 6 | 7/05-7/06 | 12 | 62 | 850 | 1.14 | 1,157 | 1.56 | 0 | 0.00 | 139 | 0.19 | 2,768 | 3.72 |
| 7 | 7/09-7/10 | 12 | 84 | 1,259 | 1.25 | 2,497 | 2.48 | 4 | 0.00 | 297 | 0.29 | 5,610 | 5.57 |
| 8 | 7/11-7/11 | 12 | 98 | 1,176 | 1.00 | 2,011 | 1.71 | 9 | 0.01 | 431 | 0.37 | 4,567 | 3.88 |
| 9 | 7/13-7/13 | 12 | 105 | 1,011 | 0.80 | 1,842 | 1.46 | 7 | 0.01 | 994 | 0.79 | 4,270 | 3.30 |
| 10 | 7/16-7/16 | 12 | 46 | 441 | 0.80 | 564 | 1.02 | 39 | 0.07 | 563 | 1.02 | 1,784 | 3.23 |
| 11 | 7/18-7/18 | 12 | 73 | 445 | 0.51 | 657 | 0.75 | 234 | 0.27 | 1,217 | 1.39 | 2,410 | 2.75 |
| 12 | 7/20-7/20 | 12 | 75 | 412 | 0.46 | 477 | 0.53 | 787 | 0.87 | 2,021 | 2.25 | 2,256 | 2.51 |
| 13 | 7/23-8/23 | 12 | 95 | 324 | 0.28 | 361 | 0.32 | 1,386 | 1.22 | 2,902 | 2.55 | 1,316 | 1.15 |
| 14 | 7/25-7/25 | 12 | 98 | 379 | 0.32 | 317 | 0.27 | 3,482 | 2.96 | 2,871 | 2.44 | 1,397 | 1.19 |
| 15 | 7/27-7/27 | 12 | 118 | 194 | 0.14 | 202 | 0.14 | 5,512 | 3.89 | 2,412 | 1.70 | 677 | 0.48 |
| 16 | 7/30-7/30 | 12 | 35 | 73 | 0.17 | 19 | 0.05 | 3,079 | 7.33 | 598 | 1.42 | 173 | 0.41 |
| 17 | 8/01-8/01 | 12 | 81 | 67 | 0.97 | 53 | 0.05 | 5,680 | 5.84 | 1,144 | 1.18 | 272 | 0.28 |
| 18 | 8/03-8/03 | 12 | 66 | 40 | 0.05 | 30 | 0.04 | 5,390 | 6.81 | 130 | 0.16 | 151 | 0.19 |
| 19 | 8/06-8/06 | 12 | 61 | 38 | 0.05 | 16 | 0.02 | 8,436 | 12.52 | 194 | 0.27 | 95 | 0.13 |
| 20 | 8/08-8/08 | 12 | 127 | 71 | 0.05 | 30 | 0.02 | 19,215 | 12.61 | 142 | 0.09 | 132 | 0.09 |
| 21 | 8/10/8/10 | 12 | 75 | 28 | 0.03 | 15 | 0.02 | 9,428 | 10.48 | 30 | 0.03 | 16 | 0.02 |
| 22 | 8/13-8/13 | 12 | 78 | 36 | 0.04 | 28 | 0.03 | 10,961 | 11.71 | 0 | 0.00 | 53 | 0.06 |
| 23 | 8/15-8/15 | 12 | 165 | 28 | 0.01 | 12 | 0.01 | 14,216 | 7.18 | 13 | 0.01 | 28 | 0.01 |
| 24 | 8/17-8/17 | 12 | 63 | 2 | 0.00 | 1 | 0.00 | 9,785 | 12.94 | 0 | 0.00 | 2 | 0.00 |
| 25 | 8/20-8/20 | 12 | 67 | 10 | 0.01 | 3 | 0.00 | 8,728 | 10.86 | 0 | 0.00 | 11 | 0.01 |
| 26 | 8/22-8/22 | 12 | 44 | 6 | 0.01 | 1 | 0.00 | 5,165 | 9.78 | 0 | 0.00 | 1 | 0.00 |
| 27 | 8/24-8/24 | 12 | 65 | 3 | 0.00 | 2 | 0.00 | 3,736 | 4.58 | 0 | 0.00 | 0 | 0.00 |
| 28 | 8/27-8/27 | 12 | 68 | 3 | 0.00 | 2 | 0.00 | 3,736 | 4.58 | 0 | 0.00 | 0 | 0.00 |
| 29 | 8/29-8/29 | 12 | 57 | 1 | 0.00 | 1 | 0.00 | 3,623 | 5.30 | 0 | 0.00 | 0 | 0.00 |
| 30 | 8/31-8/31 | 12 | 48 | 1 | 0.00 | 1 | 0.00 | 2,996 | 5.20 | 0 | 0.00 | 0 | 0.00 |
| 31 | 9/03-9/03 | 12 | 50 | 2 | 0.00 | 1 | 0.00 | 2,717 | 4.53 | 0 | 0.00 | 0 | 0.00 |
| 32 | 9/05-9/05 | 12 | 46 | 1 | 0.00 | 0 | 0.00 | 3,799 | 6.88 | 0 | 0.00 | 0 | 0.00 |
| 33 | 9/07-9/07 | 12 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| SEASON TOTAL | | 396 | 260 | 33,652 | | 17,258 | | ~~135,342~~ 132,151 | | 16,249 | | 50,424 | |

Table 17. Kuskokwim Bay subsistence salmon fishery, 1984.

| Village | FAMILIES SURVEYED Number | People | Dogs | REPORTED CATCH Chinook | Sockeye | Coho | Pink | Chum | Expanded Estimated Total Fishing Families | ESTIMATED VILLAGE SUBSISTENCE CATCH Chinook | Sockeye | Coho | Pink | Chum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quinhagak | 73 | 368 | 104 | 3,157 | 309 | 2,131 | 295 | 634 | 73 | 3,175 | 309 | 2,131 | 295 | 634 |
| Goodnews | 18 | 138 | 25 | 307 | 474 | 28 | 24 | 94 | 35 | 597 | 922 | 54 | 66 | 189 |
| Platinum | 4 | 21 | 20 | 18 | 24 | 57 | 0 | 0 | 7 | 32 | 42 | 100 | 0 | 0 |
| Goodnews Bay Subtotal | 22 | 159 | 45 | 325 | 498 | 85 | 34 | 97 | 42 | 629 | 964 | 154 | 66 | 189 |
| TOTAL | 95 | 527 | 149 | 3,482 | 807 | 2,216 | 329 | 731 | 115 | 3,804 | 1,273 | 2,285 | 361 | 823 |

Table 18. Final Season Summary for District 5, Goodnews Bay.

| | PERIOD DATES | HOURS FISHED | FISH-ERMEN | PERIOD CATCH AND CATCH PER UNIT EFFORT CHINOOK | CPUE | SOCKEYE | CPUE | COHO | CPUE | PINK | CPUE | CHUM | CPUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/18-6/19 | 12 | 29 | 1,706 | 4.90 | 348 | 1.00 | 0 | 0.00 | 0 | 0.00 | 501 | 1.44 |
| 2 | 6/21-6/22 | 12 | 35 | 1,298 | 3.09 | 967 | 2.30 | 0 | 0.00 | 0 | 0.00 | 591 | 1.41 |
| 3 | 6/25-6/26 | 12 | 38 | 1,896 | 4.16 | 2,087 | 4.58 | 0 | 0.00 | 5 | 0.01 | 2,351 | 5.16 |
| 4 | 6/28-6/29 | 12 | 37 | 807 | 1.82 | 2,097 | 4.72 | 0 | 0.00 | 12 | 0.03 | 1,981 | 4.46 |
| 5 | 7/02-7/03 | 12 | 41 | 578 | 1.17 | 2,108 | 4.28 | 0 | 0.00 | 75 | 0.15 | 1,889 | 3.84 |
| 6 | 7/05-7/06 | 12 | 36 | 351 | 0.81 | 2,056 | 4.75 | 0 | 0.00 | 135 | 0.31 | 1,720 | 3.98 |
| 7 | 7/09-7/10 | 12 | 41 | 347 | 0.71 | 2,167 | 4.40 | 0 | 0.00 | 479 | 0.97 | 1,371 | 2.79 |
| 8 | 7/12-7/13 | 12 | 40 | 327 | 0.68 | 1,444 | 3.01 | 0 | 0.00 | 465 | 0.97 | 1,057 | 2.20 |
| 9 | 7/16-7/16 | 12 | 40 | 294 | 0.61 | 902 | 1.88 | 18 | 0.04 | 627 | 1.31 | 1,215 | 2.53 |
| 10 | 7/20-7/20 | 12 | 47 | 192 | 0.34 | 395 | 0.70 | 111 | 0.20 | 590 | 1.05 | 657 | 1.16 |
| 11 | 7/23-7/23 | 12 | 36 | 97 | 0.22 | 318 | 0.74 | 195 | 0.45 | 365 | 0.84 | 253 | 0.59 |
| 12 | 7/25-7/25 | 12 | 30 | 82 | 0.23 | 135 | 0.38 | 383 | 1.06 | 230 | 0.64 | 205 | 0.57 |
| 13 | 7/27-7/27 | 12 | 38 | 104 | 0.23 | 166 | 0.36 | 1,059 | 2.32 | 391 | 0.86 | 166 | 0.36 |
| 14 | 7/30-7/30 | 12 | 35 | 73 | 0.17 | 84 | 0.20 | 1,306 | 3.11 | 243 | 0.58 | 120 | 0.29 |
| 15 | 8/01-8/01 | 12 | 32 | 70 | 0.18 | 45 | 0.12 | 2,811 | 7.32 | 370 | 0.96 | 61 | 0.16 |
| 16 | 8/03-7/03 | 12 | 35 | 76 | 0.18 | 36 | 0.09 | 3,943 | 9.39 | 261 | 0.62 | 61 | 0.15 |
| 17 | 8/06-8/06 | 12 | 39 | 79 | 0.17 | 34 | 0.07 | 4,275 | 9.31 | 138 | 0.29 | 41 | 0.09 |
| 18 | 8/08-8/08 | 12 | 43 | 60 | 0.12 | 37 | 0.07 | 2,712 | 5.26 | 103 | 0.20 | 26 | 0.05 |
| 19 | 8/10-8/10 | 12 | 40 | 36 | 0.08 | 18 | 0.04 | 4,198 | 8.75 | 58 | 0.12 | 17 | 0.04 |
| 20 | 8/13-8/13 | 12 | 37 | 36 | 0.08 | 9 | 0.02 | 4,852 | 10.93 | 28 | 0.06 | 18 | 0.04 |
| 21 | 8/15-8/15 | 12 | 40 | 26 | 0.05 | 5 | 0.01 | 5,999 | 12.50 | 25 | 0.05 | 10 | 0.02 |
| 22 | 8/17-8/17 | 12 | 37 | 22 | 0.05 | 4 | 0.01 | 6,880 | 15.50 | 23 | 0.05 | 6 | 0.01 |
| 23 | 8/20-8/20 | 12 | 40 | 12 | 0.03 | 3 | 0.01 | 9,590 | 19.98 | 19 | 0.04 | 3 | 0.01 |
| 24 | 8/22-8/22 | 12 | 34 | 9 | 0.02 | 7 | 0.02 | 6,731 | 16.50 | 17 | 0.04 | 6 | 0.01 |
| 25 | 8/24-8/24 | 12 | 41 | 9 | 0.02 | 1 | 0.00 | 4,356 | 8.85 | 7 | 0.01 | 1 | 0.00 |
| 26 | 8/27-8/27 | 12 | 37 | 13 | 0.03 | 0 | 0.00 | 2,115 | 4.76 | 28 | 0.06 | 4 | 0.01 |
| 27 | 8/29-8/29 | 12 | 44 | 4 | 0.01 | 1 | 0.00 | 3,402 | 6.44 | 3 | 0.01 | 4 | 0.01 |
| 28 | 8/31-8/31 | 12 | 45 | 1 | 0.00 | 0 | 0.00 | 2,606 | 4.83 | 5 | 0.01 | 0 | 0.00 |
| 29 | 9/03-0/03 | 12 | 38 | 2 | 0.00 | 0 | 0.00 | 1,432 | 3.14 | 7 | 0.02 | 2 | 0.00 |
| 30 | 9/05-9/05 | 12 | 31 | 5 | 0.01 | 0 | 0.00 | 2,202 | 5.92 | 2 | 0.01 | 3 | 0.01 |
| 31 | 9/07-9/07 | 12 | 0 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| SEASON TOTAL | | 372 | 77 | 8,612 | | 15,474 | | 71,176 | | 4,711 | | 14,340 | |

Table 19. Commercial herring catch data, Security Cove and Goodnews Bay Districts, 1984.

| Date | Hours | Number of Deliveries | Number of Permits | Number of Boats | Sac Roe Herring (m.t.) | Bait/ Food | Average Roe Percent |
|---|---|---|---|---|---|---|---|
| SECURITY COVE | | | | | | | |
| 5/21 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5/22 | 24 | 16 | 16 | 16 | 35.05 | 0 | 11.07 |
| 5/23 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5/24 | 24 | 3 | 3 | 3 | 3.18 | 0 | 11.16 |
| 5/25 | 24 | 19 | 18 | 18 | 33.10 | 0 | 12.14 |
| 5/26 | 24 | 3 | 3 | 3 | 1.06 | 0 | 13.55 |
| 5/27 | 24 | 1 | 1 | 1 | 1.32 | 0 | 15.00 |
| 5/28 | 24 | 4 | 4 | 4 | 22.11 | 0 | 10.52 |
| 5/29 | 24 | 18 | 13 | 13 | 138.74 | 0 | 12.12 |
| 5/30 | 24 | 15 | 11 | 11 | 33.80 | 0 | 11.14 |
| 5/31 | 24 | 2 | 2 | 2 | 0.68 | 0 | 10.37 |
| 6/01 | 24 | 3 | 2 | 2 | 11.25 | 0 | 11.13 |
| 6/02 | 24 | 2 | 2 | 2 | 14.05 | 0 | 13.36 |
| 6/03 | 24 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6/04 | 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 345 | 86 | 38 | 39 | 294.94 | 0 | 11.79 |
| GOODNEWS BAY | | | | | | | |
| 5/21 | 10 | 9 | 9 | 9 | 18.75 | 0 | 10.18 |
| 5/22 | 24 | 48 | 42 | 40 | 89.60 | 0 | 10.34 |
| 5/23 | 24 | 42 | 36 | 35 | 74.09 | 0 | 10.81 |
| 5/24 | 24 | 80 | 66 | 62 | 108.97 | 0 | 10.07 |
| 5/25 | 24 | 103 | 75 | 69 | 135.33 | 0 | 9.67 |
| 5/26 | 24 | 94 | 67 | 64 | 150.50 | 0 | 9.76 |
| 5/27 | 9 | 14 | 14 | 14 | 27.99 | 0 | 11.96 |
| TOTALS | 139 | 390 | 130 | 106 | 605.23 | 0 | 10.14 |

Table 20. Security Cove District comparative herring catch (m.t.) and effort (permit holders) by date, 1984.

| DATE | EFFORT CATCH | LOCAL 1/ | NON-LOCAL | RESIDENT 2/ | NON-RESIDENT |
|---|---|---|---|---|---|
| 5/21 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 5/22 | Effort | 1 | 15 | 3 | 13 |
| | Catch | 0.68 | 34.33 | 5.67 | 29.34 |
| 5/23 | Effort | 0 | 0 | 0 | 0 |
| | Effort | 0 | 0 | 0 | 0 |
| 5/24 | Effort | 0 | 3 | 1 | 2 |
| | Catch | 0 | 3.17 | 0.68 | 2.49 |
| 5/25 | Effort | 3 | 14 | 4 | 13 |
| | Catch | 7.57 | 24.28 | 8.73 | 23.12 |
| 5/26 | Effort | 1 | 2 | 1 | 2 |
| | Catch | 0.06 | 1.00 | 0.06 | 1.00 |
| 5/27 | Effort | 0 | 1 | 0 | 1 |
| | Catch | 0 | 1.32 | 0 | 1.32 |
| 5/28 | Effort | 2 | 2 | 2 | 2 |
| | Catch | 8.39 | 13.70 | 8.39 | 13.70 |
| 5/29 | Effort | 3 | 10 | 5 | 8 |
| | Catch | 41.38 | 104.33 | 57.70 | 88.00 |
| 5/30 | Effort | 4 | 7 | 6 | 5 |
| | Catch | 8.25 | 25.51 | 10.98 | 22.79 |
| 5/31 | Effort | 1 | 1 | 1 | 1 |
| | Catch | 0.23 | 0.45 | 0.23 | 0.45 |
| 6/01 | Effort | 0 | 2 | 1 | 1 |
| | Catch | 0 | 11.24 | 4.44 | 6.80 |
| 6/02 | Effort | 0 | 2 | 1 | 1 |
| | Catch | 0 | 14.04 | 6.32 | 7.72 |
| 6/03 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 6/04 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| SEASON TOTAL | Effort | 6 | 32 | 10 | 28 |
| | Catch | 66.56 | 233.37 | 103.2 | 196.73 |
| TOTAL % | Effort | 16 | 84 | 26 | 74 |
| TOTAL % | Catch | 22 | 78 | 34 | 66 |

1/ Residents of the AVCP region.
2/ Residents of the State of Alaska includes local fishermen.

Table 21. Goodnews Bay District comparative herring catch (m.t.) and effort (permit holders) by date, 1984.

| DATE | EFFORT/ CATCH | LOCAL | NON-LOCAL | RESIDENT 2/ | NON-RESIDENT |
|---|---|---|---|---|---|
| 5/21 | Effort | 9 | 0 | 9 | 0 |
| | Catch | 18.75 | 0 | 18.75 | 0 |
| 5/22 | Effort | 38 | 3 | 39 | 2 |
| | Catch | 75.86 | 13.74 | 80.53 | 9.07 |
| 5/23 | Effort | 33 | 3 | 34 | 2 |
| | Catch | 64.78 | 9.31 | 67.79 | 6.30 |
| 5/24 | Effort | 50 | 15 | 52 | 13 |
| | Catch | 86.31 | 22.36 | 92.28 | 16.69 |
| 5/25 | Effort | 52 | 20 | 58 | 12 |
| | Catch | 83.31 | 52.02 | 102.18 | 45.17 |
| 5/26 | Effort | 58 | 16 | 62 | 12 |
| | Catch | 89.77 | 60.73 | 105.33 | 45.17 |
| 5/27 | Effort | 6 | 8 | 9 | 5 |
| | Catch | 5.44 | 17.98 | 11.63 | 17.79 |
| SEASON TOTAL | Effort | 97 | 33 | 103 | 27 |
| | Catch | 425.52 | 176.14 | 478.49 | 122.17 |
| TOTAL % | Effort | 75 | 25 | 79 | 21 |
| TOTAL % | Catch | 71 | 29 | 80 | 20 |

1/ Residents of AVCP Region
2/ Residents of the State of Alaska includes local fishermen.

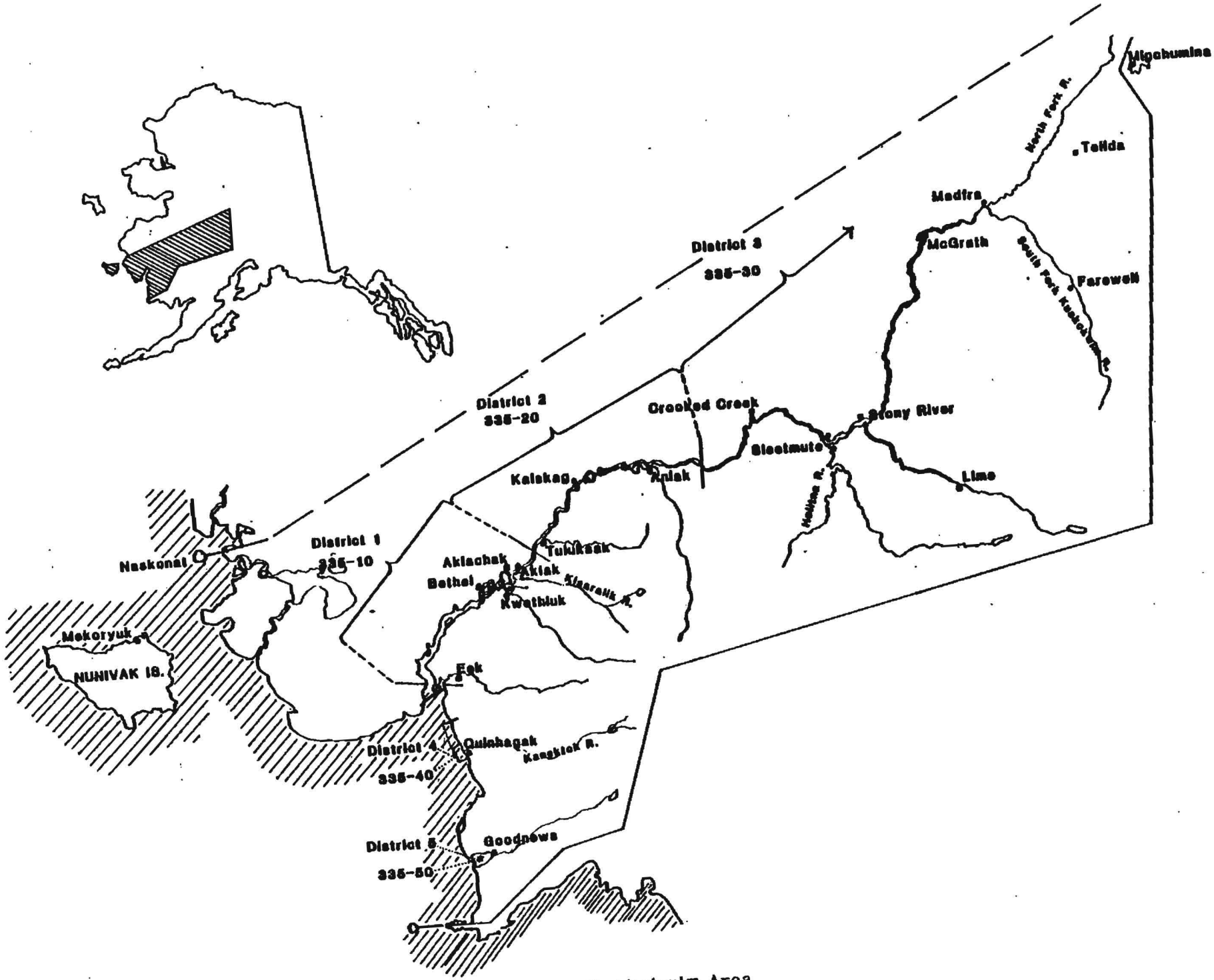


Figure 1. Kuskokwim Area

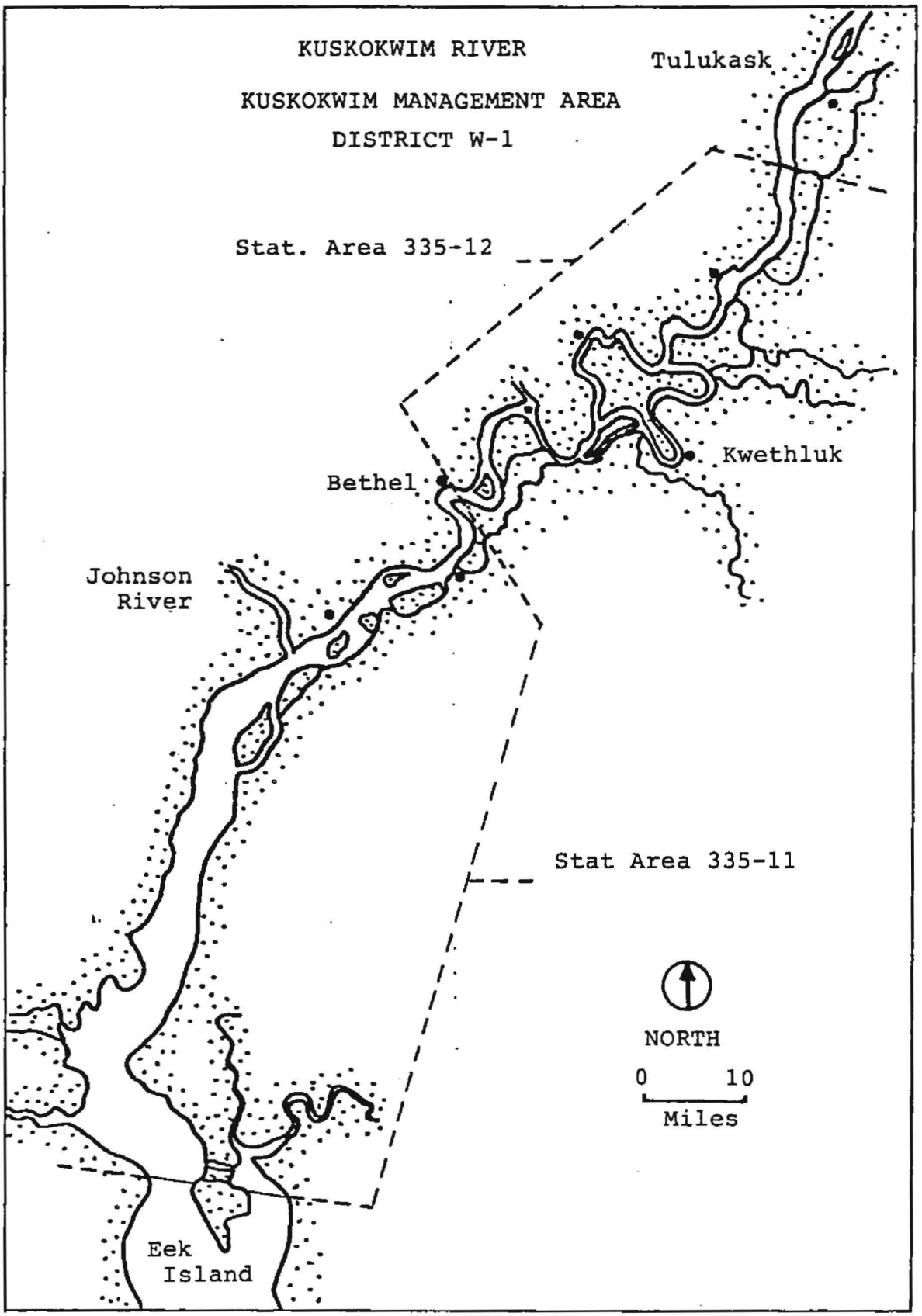


Figure 2 . Kuskokwim Management Area, District W-1, 1984.

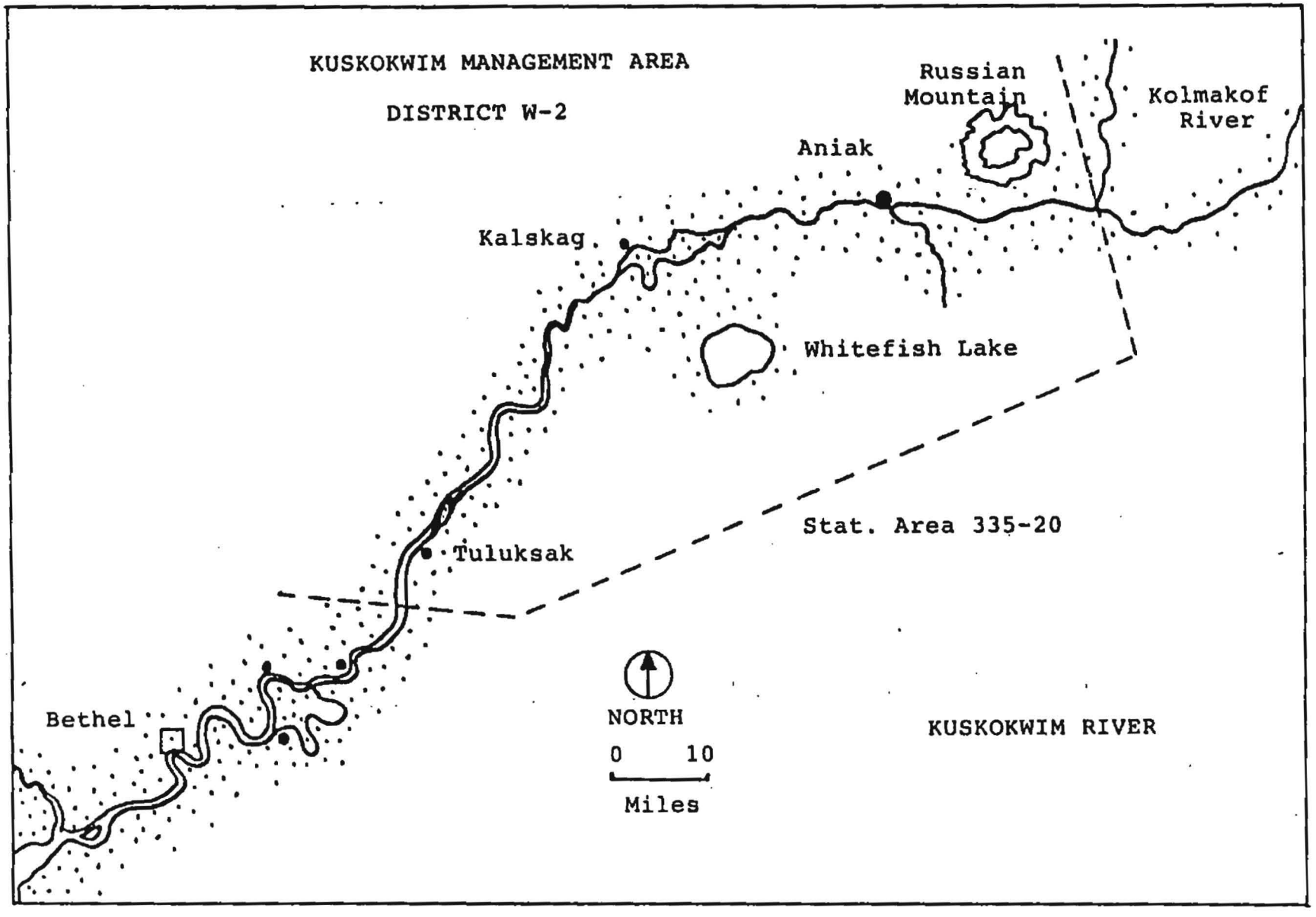


Figure 3. Kuskokwim Management Area, District W-2, 1984.

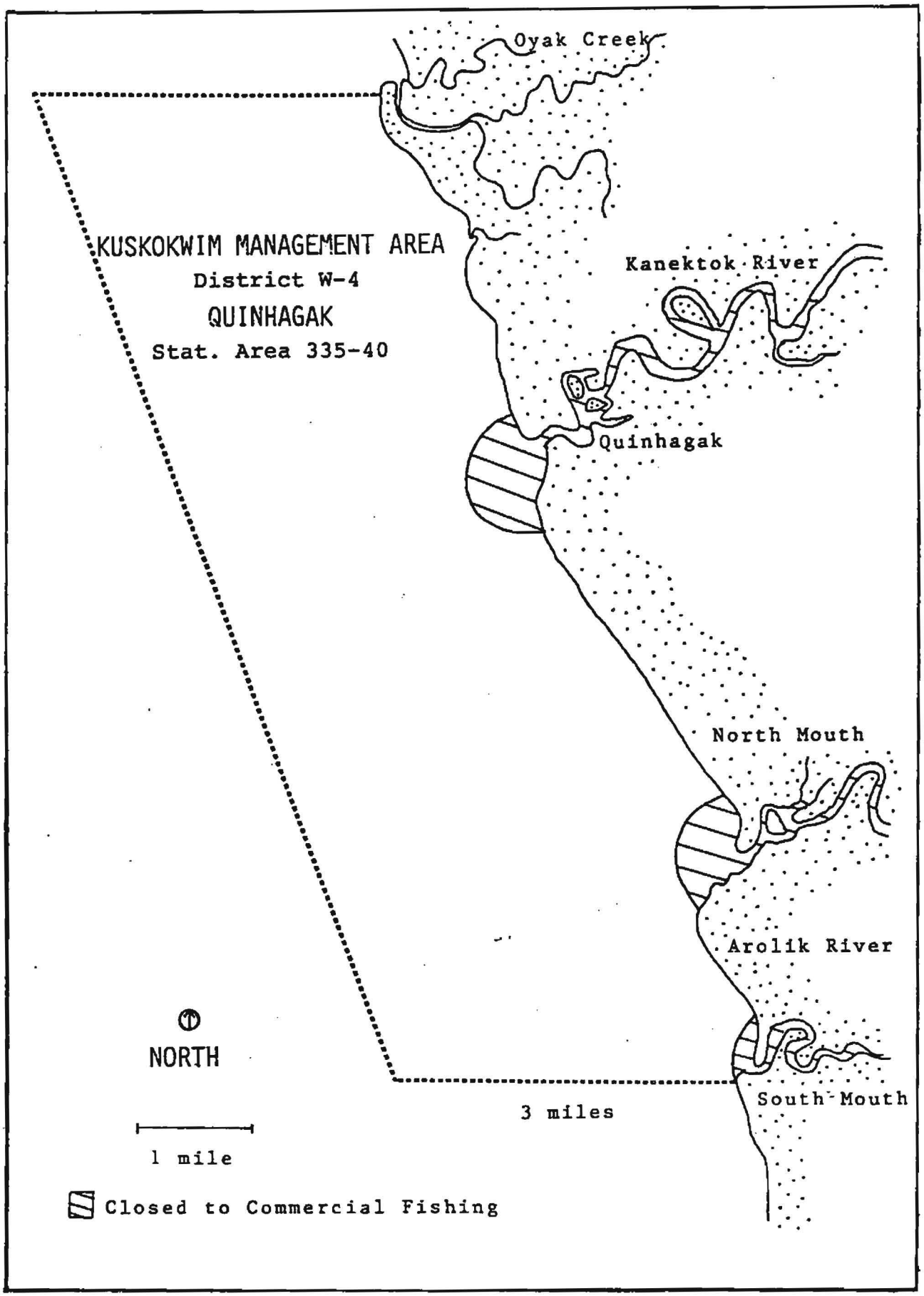


Figure 4. Kuskokwim Management Area, District W-4, 1984.

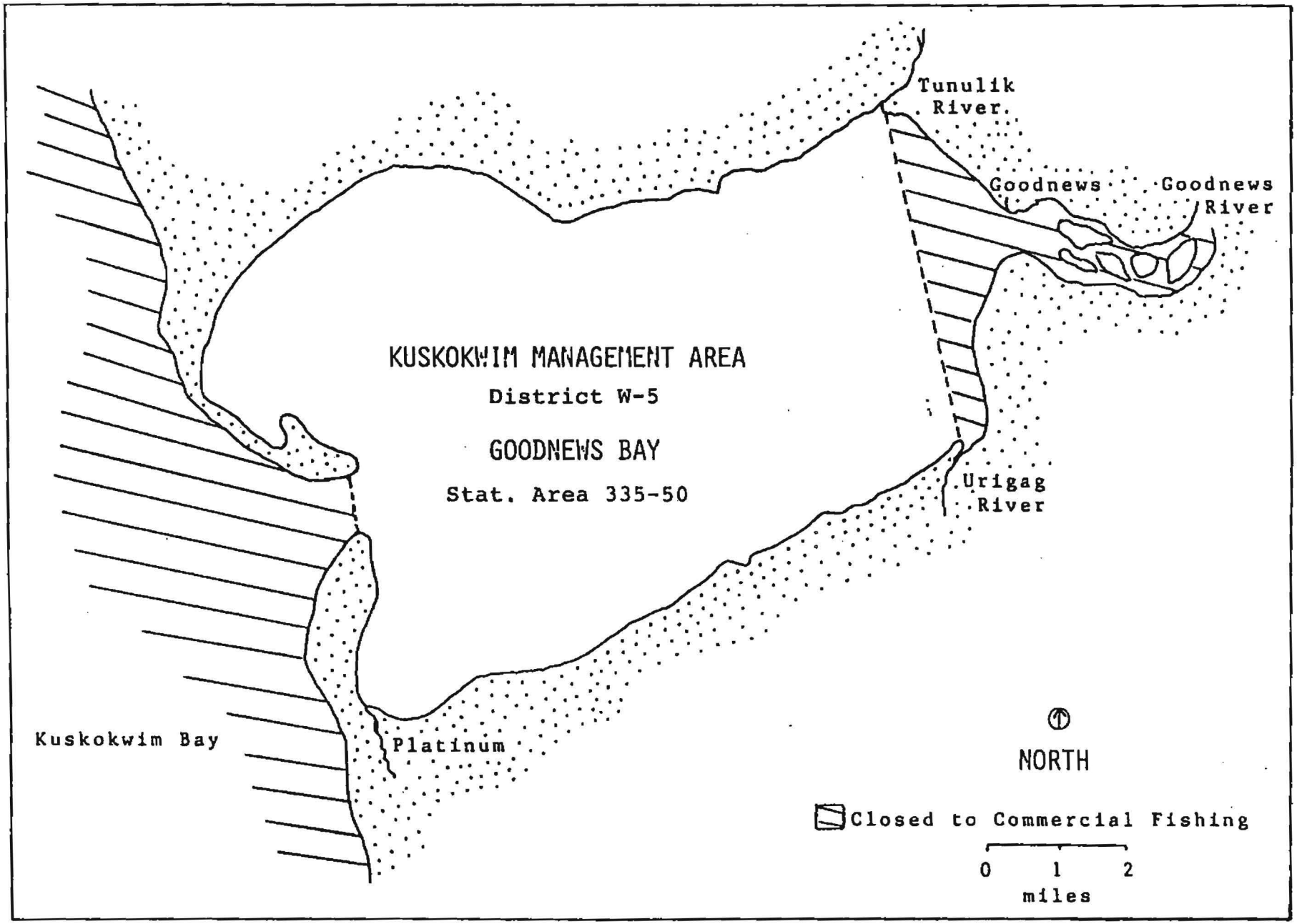


Figure 5. Kuskokwim Management Area, District W-5, 1984.

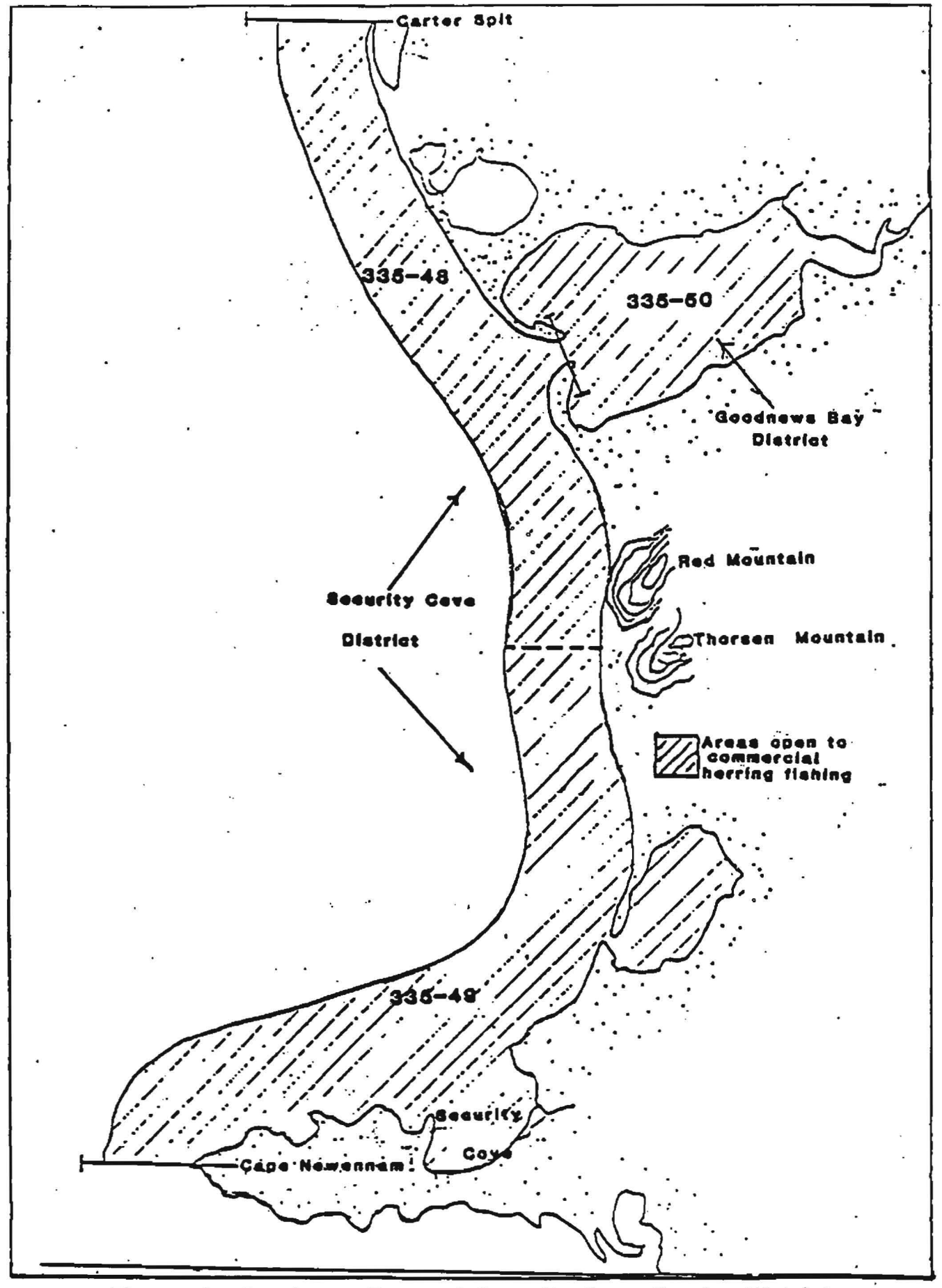


**Figure 6. Goodnews Bay and Security Cove Herring Districts and Statistical Reporting Areas.**

Appendix Table 1. Kuskokwim Area commercial and subsistence salmon catches, 1913-1984.

| | COMMERCIAL CATCH | | | | | | SUBSISTENCE CATCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DATE | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL | CHINOOK | OTHER SALMON1/ | TOTAL |
| 1913 | 7,800 | | | | | 7,800 | | | |
| 1914 | | 2,667 | | | | 2,667 | | | |
| 1915 | | | | | | | | | |
| 1916 | 949 | | | | | 949 | | | |
| 1917 | 7,878 | | | | | 7,878 | | | |
| 1918 | 3,055 | | | | | 3,055 | | | |
| 1919 | 4,836 | | | | | 4,836 | | | |
| 1920 | 34,853 | | | | | 34,853 | | | |
| 1921 | 9,854 | | | | | 9,854 | | | |
| 1922 | 8,944 | 6,120 | | | | 15,064 | | | 180,000 |
| 1923 | 7,254 | | | | | 7,254 | | | |
| 1924 | 19,253 | 900 | 7,167 | 7,167 | | 34,487 | 17,700 | 203,148 | ~~217,848~~ 220,848 |
| 1925 | 1,644 | 5,800 | | | | ~~7,514~~ 7,444 | 10,800 | 230,850 | 241,650 |
| 1926 | | | | | | | | | 738,576 |
| 1927 | | | | | | | | | 286,254 |
| 1928 | | | | | | | | | 481,090 |
| 1929 | | | | | | | | | 560,196 |
| 1930 | 7,626 | 2,448 | | | | ~~9,963~~ 10,074 | | | 538,650 |
| 1931 | 8,541 | | | | | 8,541 | | | 389,367 |
| 1932 | 9,339 | | | | | 9,339 | | | 746,415 |
| 1933 | | | | | | | 6,290 | 443,998 | ~~440,288~~ 450,288 |
| 1934 | | | | | | | 20,800 | 597,132 | 617,932 |
| 1935 | 6,448 | | 8,296 | | | 14,744 | 22,930 | 554,040 | 576,~~980~~ 970 |
| 1936 | 624 | | | | | 624 | 33,500 | 549,423 | 582,923 |
| 1937 | 480 | | | | | 480 | | | 537,111 |
| 1938 | 624 | | 828 | | | 1,452 | 10,153 | 400,242 | 410,395 |
| 1939 | 134 | | | | | 134 | 14,000 | 125,425 | 139,425 |
| 1940 | 247 | | 500 | | | 747 | 8,000 | 415,523 | 423,523 |
| 1941 | 187 | | 674 | | | 861 | 8,000 | 415,523 | ~~423,523~~ |
| 1942 | | | | | | | 6,400 | 325,339 | 331,739 |

Appendix Table 1 (continued).

| DATE | COMMERCIAL CATCH | | | | | | SUBSISTENCE CATCH | | |
|---|---|---|---|---|---|---|---|---|---|
| | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL | CHINOOK | OTHER SALMON1/ | TOTAL |
| 1943 | | | | | | | 6,400 | 325,339 | 331,739 |
| ... | | | | | | | | | |
| 1946 | 2,288 | | 674 | | | 2,962 | | | |
| 1947 | 5,356 | | | | | 5,356 | | | |
| ... | | | | | | | | | |
| 1951 | 4,210 | | | | | 4,210 | | | |
| ... | | | | | | | | | |
| 1954 | 57 | | | | | 57 | | | |
| ... | | | | | | | | | |
| 1959 | 3,760 | | | | | 3,760 | | | |
| 1960 | 5,969 | 5,649 | 5,498 | | 3 | 17,119 | 20,361 | 327,297 | 347,658 |
| 1961 | 23,246 | 2,308 | 5,090 | 91 | 18,864 | 49,599 | 30,910 | 185,447 | 216,357 |
| 1962 | 20,867 | 10,313 | 12,598 | 4,340 | 45,707 | ~~93,831~~ 93,825 | 14,642 | 165,626 | 180,268 |
| 1963 | 18,571 | | 15,660 | | | 34,231 | 37,246 | 141,550 | 178,796 |
| 1964 | 21,230 | 13,422 | 28,992 | 939 | 707 | 65,290 | 30,853 | 214,942 | 245,795 |
| 1965 | 24,965 | 1,886 | 12,191 | | 4,242 | 43,284 | 31,143 | 323,002 | 354,145 |
| 1966 | 25,823 | 1,030 | 22,985 | 268 | 2,610 | 52,716 | 53,606 | 201,002 | 254,608 |
| 1967 | 29,986 | 652 | 58,239 | | 8,235 | 97,112 | 61,224 | 252,447 | 313,671 |
| 1968 | 43,157 | 5,887 | 154,302 | 75,818 | 19,694 | 298,~~845~~858 | 34,986 | 301,531 | 336,517 |
| 1969 | 64,777 | 10,362 | 110,473 | 1,251 | 50,377 | 237,240 | 43,732 | 245,299 | 289,031 |
| 1970 | 65,032 | 12,654 | 62,245 | 27,422 | 60,566 | 227,~~979~~ | 71,376 | 263,746 | 335,112 |
| 1971 | 44,936 | 6,054 | 10,006 | 13 | 99,423 | 160,432 | 45,465 | 130,329 | 175,974 |
| 1972 | 55,482 | 4,312 | 23,880 | 1,952 | 97,197 | 182,823 | 43,335 | 131,514 | ~~184,849~~ 174,347 |
| 1973 | 51,374 | 5,224 | 152,408 | 634 | 184,207 | 393,847 | 41,697 | 211,468 | 253,165 |
| 1974 | 30,670 | 29,003 | 179,579 | 60,052 | 196,127 | 495,431 | 29,590 | 321,358 | 350,848 |
| 1975 | 27,799 | 17,535 | 109,814 | 899 | 223,532 | 379,579 | 51,045 | 180,429 | 231,474 |
| 1976 | 49,262 | 13,636 | 112,130 | 39,998 | 231,877 | 447,903 | 60,603 | 239,461 | 300,064 |
| 1977 | 58,256 | 18,621 | 263,728 | 434 | 298,959 | 629,998 | 58,163 | 218,824 | 276,987 2/ |
| 1978 | 63,194 | 13,734 | 247,271 | 61,968 | 282,044 | 668,211 | 38,209 | 137,489 | 175,698 |
| 1979 | 53,314 | 39,463 | 308,683 | 574 | 297,167 | 299,201 | 57,283 | 190,582 | 247,865 |

Appendix Table 1 (continued).

| | COMMERCIAL CATCH | | | | | | SUBSISTENCE CATCH | | |
|---|---|---|---|---|---|---|---|---|---|
| DATE | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL | CHINOOK | OTHER SALMON1/ | TOTAL |
| 1980 | 48,242 | 42,213 | 327,908 | 30,306 | 561,483 | 1,010,152 | 59,900 | 105,000 | 164,900 |
| 1981 | 79,378 | 105,940 | 278,587 | 463 | 485,635 | 950,003 | 63,640 | 187,732 | ~~251,572~~ 251,372 |
| 1982 | 79,816 | 97,716 | 567,451 | 18,259 | 325,471 | 1,088,713 | 61,146 | 194,200 | 255,346 |
| 1983 | 93,676 | 90,834 | 249,018 | 379 | 306,554 | 740,461 | 50,704 | 136,242 | 186,946 |
| 1984 | 74,006 | 81,307 | 829,965 | 23,902 | 488,482 | 1,497,662 | 61,004 | 167,542 | 228,546 |
| 5 YEAR AVERAGE (1979-1983) | 70,885 | 75,233 | 346,329 | 9,996 | 395,262 | 897,706 | 58,535 | 162,751 | 221,356 |

1/ Primarily chum salmon and coho salmon.
2/ Goodnews Bay not surveyed prior to 1977.
3/ Preliminary figures.

Appendix Table 2. Kuskokwim Area, commercial effort by district, 1970-1984. 1/

| YEAR | CHINOOK SEASON | CHUM SEASON | COHO SEASON | TOTAL |
|---|---|---|---|---|
| DISTRICT 1 | | | | |
| 1970 | 361 | 2/ | 266 | 387 |
| 1971 | 418 | 216 | 83 | 422 |
| 1972 | 405 | 176 | 245 | 425 |
| 1973 | 456 | 341 | 411 | 530 |
| 1974 | 606 | 467 | 516 | 666 |
| 1975 | 472 | 540 | 533 | 737 |
| 1976 | 561 | 517 | 516 | 674 |
| 1977 | 563 | 522 | 572 | 653 |
| 1978 | 615 | 61 | 597 | 723 |
| 1979 | 591 | 617 | 613 | 685 |
| 1980 | 553 | 579 | 586 | 663 |
| 1981 | 589 | 613 | 586 | 679 |
| 1982 | 610 | 576 | 596 | 686 |
| 1983 | 544 | 619 | 577 | 679 |
| 1984 | 520 | 587 | 619 | 654 |
| Previous 5 Year Average (1979-1983) | 577 | 601 | 592 | 678 |
| DISTRICT 2 | | | | |
| 1970 | 10 | 2/ | 11 | 18 |
| 1971 | 22 | 2/ | 2/ | 22 |
| 1972 | 12 | 2/ | 2/ | 12 |
| 1973 | 28 | 2/ | 2/ | 28 |
| 1974 | 36 | 2/ | 16 | 37 |
| 1975 | 38 | 2/ | 2/ | 38 |
| 1976 | 55 | 2/ | 11 | 57 |
| 1977 | 83 | 54 | 24 | 105 |
| 1978 | 28 | 2/ | 16 | 43 |
| 1979 | 41 | 2/ | 20 | 43 |
| 1980 | 37 | 21 | 12 | 43 |
| 1981 | 153 | 11 | 16 | 153 |
| 1982 | 38 | 50 | 25 | 60 |
| 1983 | 14 | 42 | 9 | 43 |
| 1984 | 15 | 49 | 32 | 58 |
| Previous 5 Year Average (1979-1983) | 57 | 31 | 16 | 68 |

Appendix Table 2. (Continued). Kuskokwim Area, commercial effort by district, 1970-1984. 1/

| District 4 | | District 5 | |
|---|---|---|---|
| YEAR | TOTAL | YEAR | TOTAL |
| 1970 | 88 | 1970 | 35 |
| 1971 | 61 | 1971 | 16 |
| 1972 | 107 | 1972 | 14 |
| 1973 | 109 | 1973 | 21 |
| 1974 | 196 | 1974 | 49 |
| 1975 | 197 | 1975 | 50 |
| 1976 | 181 | 1976 | 40 |
| 1977 | 258 | 1977 | 34 |
| 1978 | 200 | 1978 | 35 |
| 1979 | 206 | 1979 | 30 |
| 1980 | 169 | 1980 | 48 |
| 1981 | 186 | 1981 | 48 |
| 1982 | 177 | 1982 | 48 |
| 1983 | 226 | 1983 | 79 |
| 1984 | 260 | 1984 | 77 |
| Previous 5 Year Average (1979-1983) | 201 | | 66 |

Kuskokwim Area 3/

| YEAR | TOTAL |
|---|---|
| 1984 | 744 |

1/ Number of actual fishing vessels
2/ No commercial fishing allowed.
3/ Data not available for years prior to 1984.

Appendix Table 3. Kuskokwim Area Salmon Fleet Description, 1978 and 1983. 1/

| YEAR | NUMBER FISHING VESSELS | MEAN HORSE POWER | PERCENT GASOLINE ENGINE | MEAN VESSEL LENGTH | MEAN VESSEL AGE | HULL TYPE PERCENT AL 2/ | FG 3/ | UNK 4/ | WOOD | NUMBER TENDERS |
|---|---|---|---|---|---|---|---|---|---|---|
| 1978 5/ | 651 | 43 | 98.1 | 22 | 10 | 9.2 | 1.3 | 0.6 | 88.9 | 21 |
| 1983 | 912 | 60 | 98.5 | 22 | 7 | 22.6 | 3.0 | 1.1 | 73.3 | 33 |

1/ Data from the 1978 and 1983 AYK Fleet Descriptions, project: 84128.1 Commercial Fisheries Entry Commission (C.F.E.C.), May 18, 1984.
2/ Aluminum
3/ Fiberglass
4/ Unknown
5/ 1978 was the first year C.F.E.C. had vessel license information.

✓ 4a

Appendix Table 4. Kuskokwim Area commercial catches by drainage, 1960-1984

| KUSKOKWIM 1/ | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL |
|---|---|---|---|---|---|---|
| 1960 | 5,969 | 0 | 2,498 | 0 | | 8,467 |
| 1961 | 18,918 | 0 | 5,044 | 0 | | 23,962 |
| 1962 | 15,341 | 0 | 12,432 | 0 | | 27,773 |
| 1963 | 12,016 | 0 | 15,660 | 0 | | 27,676 |
| 1964 | 17,149 | 0 | 28,613 | 0 | | 45,762 |
| 1965 | 21,989 | 0 | 12,191 | 0 | | 34,180 |
| 1966 | 25,545 | 0 | 22,985 | 0 | | ~~34,180~~ 48,530 |
| 1967 | 29,986 | 0 | 56,313 | 0 | 148 | 86,447 |
| 1968 | 34,278 | 0 | 127,306 | 0 | 187 | 161,771 |
| 1969 | 43,997 | 322 | 83,765 | 0 | 7,165 | 135,249 |
| 1970 | 39,290 | 117 | 38,601 | 44 | 1,664 | 79,716 |
| 1971 | 40,274 | 2,606 | 5,253 | 0 | 68,914 | 117,047 |
| 1972 | 39,454 | 102 | 22,579 | 8 | 78,619 | 140,762 |
| 1973 | 32,838 | 369 | 130,876 | 33 | 148,746 | 312,862 |
| 1974 | 18,664 | 136 | 147,269 | 84 | 171,887 | ~~337,984~~ 338,040 |
| 1975 | 21,720 | 23 | 81,945 | 10 | 181,840 | 285,538 |
| 1976 | 30,735 | 2,971 | 88,501 | 133 | 177,864 | 300,204 |
| 1977 | 35,830 | 9,379 | 241,364 | 203 | 248,721 | 535,~~451~~ 497 |
| 1978 | 45,641 | 733 | 213,393 | 5,832 | 248,656 | 514,255 |
| 1979 | 38,966 | 1,054 | 219,060 | 78 | 261,874 | 521,032 |
| 1980 | 35,881 | 360 | 222,0~~7~~2 | 803 | 483,211 | 742,~~297~~ 267 |
| 1981 | 47,663 | 48,375 | 211,2~~5~~1 | 292 | 418,677 | 726,258 |
| 1982 | 48,234 | 33,154 | 447,117 | 1,748 | 278,306 | 808,559 |
| 1983 | 33,174 | 68,855 | 196,287 | 211 | 267,698 | 575,225 |
| 1984 | 31,742 | 48,575 | ~~623,447~~ 593,447 | 2,942 | 423,718 | 1,130,424 |
| 5 year average (1979-1983) | 40,783 | 30,360 | 259,145 | 626 | 343,753 | 674,674 |

1/ Districts 1 and 2.

✓ 4b

Appendix Table 4. Kuskokwim Area commercial catches by drainage, 1960-1984 (continued).

| KANEKTOK | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL |
|---|---|---|---|---|---|---|
| 1960 | 0 | 5,649 | 3,000 | 0 | 0 | 8,649 |
| 1961 | 4,328 | 2,308 | 46 | 90 | 18,854 | 25,636 |
| 1962 | 5,526 | 10,313 | 0 | 4,340 | 45,707 | 65,886 |
| 1963 | 6,555 | 0 | 0 | 0 | 0 | 6,555 |
| 1964 | 4,081 | 13,422 | 379 | 939 | 707 | 19,528 |
| 1965 | 2,976 | 1,886 | 0 | 0 | 4,242 | 9,104 |
| 1966 | 278 | 1,030 | 0 | 268 | 2,610 | 4,186 |
| 1967 | 0 | 652 | 1,926 | 0 | 8,087 | 10,665 |
| 1968 | 8,879 | 5,884 | 21,511 | 75,818 | 19,497 | 131,589 |
| 1969 | 16,802 | 3,784 | 15,077 | 953 | 38,206 | 74,822 |
| 1970 | 18,269 | 5,393 | 16,850 | 15,195 | 46,556 | 102,623 |
| 1971 | 4,185 | 3,118 | 2,982 | 12 | 30,203 | 40,506 |
| 1972 | 15,880 | 3,286 | 376 | 1,878 | 17,247 | 38,667 |
| 1973 | 14,993 | 2,783 | 16,515 | 277 | 19,680 | 54,248 |
| 1974 | 8,704 | 19,510 | 10,979 | 43,642 | 15,928 | 98,133 |
| 1975 | 3,928 | 8,584 | 10,742 | 486 | 35,233 | 58,973 |
| 1976 | 14,110 | 6,090 | 13,777 | 31,412 | 43,659 | 109,048 |
| 1977 | 19,090 | 5,519 | 0,028 | 202 | 43,707 | 77,546 |
| 1978 | 12,335 | 7,589 | 20,114 | 47,033 | 24,798 | 111,869 |
| 1979 | 11,144 | 18,828 | 47,525 | 295 | 25,995 | 103,787 |
| 1980 | 10,387 | 13,221 | 62,610 | 21,671 | 65,984 | 173,873 |
| 1981 | 24,525 | 17,292 | 47,587 | 160 | 53,316 | 142,880 |
| 1982 | 22,106 | 25,685 | 73,651 | 11,838 | 33,336 | 166,616 |
| 1983 | 46,385 | 10,263 | 32,442 | 168 | 23,090 | 112,348 |
| 1984 | 33,652 | 17,258 | 135,342 | 16,249 | 50,424 | 252,925 |
| 5 Year Average (1979-1983) | 22,909 | 17,058 | 52,763 | 6,826 | 40,344 | 139,900 |

4c ✓

Appendix Table 4. Kuskokwim Area commercial catches by drainage, 1960-1984 (continued).

| GOODNEWS BAY | CHINOOK | SOCKEYE | COHO | PINK | CHUM | TOTAL |
|---|---|---|---|---|---|---|
| 1968 | | | 5,485 | | | 5,485 |
| 1969 1/ | 3,987 | 6,256 | 11,631 | 298 | 5,006 | 27,169 |
| 1970 | 7,163 | 7,144 | 6,974 | 12,183 | 12,346 | 45,630 |
| 1971 | 477 | 330 | 1,771 | 0 | 301 | 2,879 |
| 1972 | 264 | 924 | 925 | 66 | 1,331 | 3,510 |
| 1973 | 3,543 | 2,072 | 5,017 | 324 | 15,781 | 26,737 |
| 1974 | 3,302 | 9,357 | 21,340 | 16,373 | 8,942 | 59,314 |
| 1975 | 2,156 | 9,098 | 17,889 | 419 | 5,904 | 35,466 |
| 1976 | 4,417 | 5,575 | 9,852 | 8,453 | 10,354 | 38,651 |
| 1977 | 3,336 | 3,723 | 13,335 | 29 | 6,531 | 26,954 |
| 1978 | 5,218 | 5,412 | 13,764 | 9,103 | 8,590 | 42,087 |
| 1979 | 3,204 | 19,581 | 42,098 | 201 | 9,298 | 74,382 |
| 1980 | 2,331 | 28,632 | 43,256 | 7,832 | 11,748 | 93,799 |
| 1981 | 7,190 | 40,273 | 19,749 | 11 | 13,642 | 80,865 |
| 1982 | 9,476 | 38,877 | 46,683 | 4,673 | 13,829 | 113,538 |
| 1983 | 14,117 | 11,716 | 19,660 | 0 | 6,766 | 52,259 |
| 1984 | 8,612 | 15,474 | 71,176 | 4,711 | 14,340 | 114,313 |
| 5 Year Average (1979-1984) | 7,264 | 27,816 | 34,289 | 2,443 | 11,057 | 82,869 |

1/ District 5 and includes Chagvan Bay.

Appendix Table 5. Dollar value estimates of Kuskokwim Area commercial salmon fishery, 1964-1984. 1/

| YEAR | GROSS VALUE OF CATCH TO FISHERMEN | WAGES EARNED 2/ | TOTAL INCOME TO DISTRICT | VALUE OF PACK 3/ | TAX REVENUE TO STATE 4/ |
|---|---|---|---|---|---|
| 1964 | 83,030.00 | | | 409,700.00 | 6,100.00 |
| 1965 | 90,950.00 | | | 370,000.00 | 8,200.00 |
| 1966 | 87,466.00 | | | 406,500.00 | 8,100.00 |
| 1967 | 138,647.00 | 20,000.00 | 158,647.00 | 727,000.00 | N/A |
| 1968 | 290,370.00 | 40,000.00 | 330,370.00 | 1,135,000.00 | 17,000.00 |
| 1969 | 297,233.00 | 60,435.00 | 357,668.00 | N/A | N/A |
| 1970 | 362,470.00 | 127,327.00 | 489,797.00 | 1,300,000.00 | 20,000.00 |
| 1971 | 371,220.00 | 80,510.00 | 451,730.00 | 672,180.00 | 16,770.00 |
| 1972 | 360,727.00 | 85,895.00 | 447,662.00 | N/A | N/A |
| 1973 | 827,735.00 | 150,000.00 | 977,735.00 | 3,600,000.99 | 32,000.00 |
| 1974 | 1,056,042.00 | 150,000.00 | 1,206,042.00 | N/A | N/A |
| 1975 | 899,178.00 | 165,000.00 | | 2,000,000.00 | 25,000.00 |
| 1976 | 1,380,229.00 | 175,000.00 | 1,555,229.00 | N/A | N/A |
| 1977 | 3,891,950.00 | 200,000.00 | 4,091,950.00 | N/A | N/A |
| 1978 | 2,337,470.00 | 250,000.00 | 2,578,470.00 | N/A | N/A |
| 1979 | 3,678,000.00 | 275,000.00 | 3,953,000.00 | N/A | N/A |
| 1980 | 2,725,134.00 | 300,000.00 | 3,025,134.00 | N/A | N/A |
| 1981 | 3,766,525.00 | 325,000.00 | 4,091,525.00 | N/A | N/A |
| 1982 | 4,213,954.00 | 350,000.00 | 4,563,954.00 | N/A | 98,240.00 5/ |
| 1983 | 2,670,400.00 | N/A | N/A | N/A | 37,254.00 |
| 1984 | 5,809,000.00 | N/A | N/A | N/A | N/A |

1/ Information not available for wages earned during 1964-1966
2/ Includes wages paid to tenderboat operators, processing plant and employees in the district.
3/ Based on type of processing when fish were shipped out of the district.
4/ Audit Division, Department of Revenue
5/ One-half of this revenue is "shared back" to city of Bethel.

85 3,253,453
86 4,746,089 22% ↑ of Avg

81-85 Avg 3,894,932

Appendix Table 6. Mean salmon weights and prices paid to fishermen, Kuskokwim Area, 1964-1984.

| YEAR | CHINOOK | SOCKEYE | COHO | PINK | CHUM |
|---|---|---|---|---|---|
| Mean Weights - Lb. | | | | | |
| 1964 | 23.2 | 5.8 | 6.5 | 2/ | 6.1 |
| 1965 | 21.7 | 6.6 | 6.5 | 2/ | 2/ |
| 1966 | 23.2 | 2/ | 6.7 | 2/ | 2/ |
| 1967 | 27.8 | 7.4 | 5.9 | 2/ | 7.0 |
| 1968 | 23.8 | 6.2 | 7.2 | 4.0 | 7.9 |
| 1969 | 19.6 | 6.2 | 7.3 | 3.6 | 5.8 |
| 1970 | 18.9 | 5.4 | 7.3 | 3.3 | 6.1 |
| 1971 | 26.2 | 6.9 | 6.1 | 2/ | 6.4 |
| 1976 | 17.0 | 6.7 | 7.8 | 3.5 | 7.0 |
| 1977 | 22.7 | 8.3 | 7.8 | 3.9 | 7.3 |
| 1978 | 24.2 | 6.5 | 7.1 | 3.9 | 8.9 |
| 1979 | 16.6 | 6.9 | 7.9 | 3.9 | 7.0 |
| 1980 | 14.1 | 6.7 | 6.9 | 3.6 | 6.4 |
| 1981 | 17.8 | 7.2 | 6.4 | 3.5 | 7.5 |
| 1982 | 19.3 | 7.2 | 7.3 | 3.6 | 7.3 |
| 1983 | 18.8 | 6.8 | 6.8 | 3.5 | 7.4 |
| 1984 | 16.4 | 6.6 | 7.7 | 3.2 | 6.7 |
| Mean Price Per Pound | | | | | |
| 1964 | 0.14 | 0.09 | 0.05 | 2/ | 2/ |
| 1965 1/ | | | | | |
| 1966 | 0.13 | | 0.06 | | 2/ |
| 1967 | 0.13 | 0.05 | 0.09 | 2/ | 0.04 |
| 1968 | 0.16 | 0.10 | 0.09 | 0.05 | 0.04 |
| 1969 | 0.19 | 0.15 | 0.10 | 0.06 | 0.07 |
| 1970 | 0.20 | 0.21 | 0.14 | 0.08 | 0.08 |
| 1971 3/ | 0.17 | 0.10 | 0.13 | 2/ | 0.08 |
| 1972 | 0.20 | | 0.16 | 2/ | 0.08 |
| 1973 | 0.25 | | 0.26 | 2/ | 0.19 |
| 1974 | 0.46 | 0.34 | 0.27 | 0.23 | 0.25 |
| 1975 | 0.54 | 2/ | 0.31 | | 0.26 |
| 1976 4/ | 0.64 | 0.43 | 0.40 | 0.25 | 0.27 |
| 1977 | 1.15 | 0.45 | 0.65 | 0.25 | 0.45 |
| 1978 | 0.50 | 4.49 | 0.40 | 0.12 | 0.32 |
| 1979 | 0.66 | 0.53 | 0.75 | 0.11 | 0.37 |
| 1980 | 0.47 | 0.31 | 0.64 | 0.12 | 0.24 |
| 1981 | 0.84 | 0.61 | 0.63 | 0.11 | 0.23 |
| 1982 | 0.82 | 0.41 | 0.53 | 0.05 | 0.22 |
| 1983 | 0.54 | 0.51 | 0.39 | 0.05 | 0.33 |
| 1984 | 0.89 | 0.52 | 0.55 | 0.07 | 0.28 |

1/ Samples available only for two periods: 7/1-2 - 7/5-6
2/ Information unavailable
3/ Information not available for District 5.
4/ Information not available for District 4.

Appendix Table 7. Commercial salmon pack by species in round weight (lbs.) Kuskokwim Area, 1968-1984. 1/

| | 1968 | 1969 |
|---|---|---|
| Fresh or Frozen | | |
| Chinook | 794,682 | 1,032,863 |
| Sockeye | 36,480 | 25,351 |
| Coho | 1,090,690 | 32,254 |
| Pink | 303,270 | 3,413 |
| Chum | 146,230 | 249,007 |
| Salmon Roe | | |
| (lbs. of finished product) | 2/ | 56,926 |

| | 1970 | 1971 | 1972 | 1973 | 1974 |
|---|---|---|---|---|---|
| Fresh or Frozen | | | | | |
| Chinook | 1,113,890 | 801,628 | 1,400,243 | 1,371,685 | 566,941 |
| Sockeye | 68,116 | 30,635 | 4,319 | 37,816 | 179,768 |
| Coho | 453,125 | 64,457 | 152,832 | 883,966 | 1,245,132 |
| Pink | 90,703 | | 6,442 | 2,092 | 246,134 |
| Chum | 367,715 | 678,173 | 631,781 | 1,252,607 | 1,220,496 |
| Salmon Roe | | | | | |
| (lbs of finished product) | 42,958 | 64,136 | 62,963 | 165,574 | 2/ |

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Fresh or Frozen | | | | | |
| Chinook | 159,845 | 935,652 | 1,326,773 | 1,530,461 | 999,043 |
| Sockeye | 108,216 | 95,761 | 154,706 | 89,489 | 320,541 |
| Coho | 670,598 | 809,916 | 2,009,171 | 1,758,213 | 2,418,186 |
| Pink | 2,809 | 133,911 | 1,478 | 241,523 | 2,290 |
| Chum | 1,350,936 | 1,609,718 | 2,185,549 | 2,508,123 | 2,059,686 |
| Salmon Roe | | | | | |
| (lbs. of finished product) | 43,113 | 120,405 3/ | 109,105 3/ | 140,496 3/ | |

Appendix Table 7. Commercial salmon pack by species in round weight (lbs.) Kuskokwim Area, 1968-1984 (continued). 1/

| | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|
| Fresh or Frozen | | | | | |
| Chinook | 617,137 | 1462,593 | 1,541,023 | 1,760,768 | 1,212,050 |
| Sockeye | 290,251 | 761,848 | 707,560 | 620,891 | 643.909 |
| Coho | 2,234,781 | 1,862,836 | 4,143,834 | 1,698,880 | 6,384,058 |
| Pink | 107,719 | 1,628 | 66,202 | 1,315 | 76,946 |
| Chum | 3,471,378 | 3,538,440 | 2,379,227 | 2,274,730 | 3,289,162 |
| Salmon Roe | | | | | |
| (lbs. of finished products) | 110,806 | 26,321 | 2/ | 2/ | 2/ |

1/ Pack represents type of processing when fish were shipped out of district.
2/ Information not available.
3/ Raw product.

Appendix Table 8. Fishes commonly found in the Kuskokwim Area.

| SPECIES CODE | GENUS AND SPECIES[1] | COMMON NAME[1] |
|---|---|---|
| 162 | Cottus cognatus | Slimy Sculpin |
| 410 | Oncorhynchus tshawytscha | Chinook Salmon |
| 420 | Onchornynchus nerka | Sockeye Salmon |
| 430 | Onchorhynchus kisutch | Coho Salmon |
| 440 | Onchornynchus gorbuscha | Pink Salmon |
| 450 | Onchorhynchus keta | Chum Salmon |
| 500 | Esox lucius | Northern Pike |
| 513 | Osmerus mondax | Rainbow Smelt |
| 514 | Hypomesus olidus | Pond Smelt |
| 520 | Salvelinus alpinus | Arctic Char |
| 541 | Salmo gairdneri | Rainbow Trout |
| 550 | Salvelinus namaycush | Lake Trout |
| 570 | Stenodus leucichtnys | Inconnu |
| 581 | Coregonus nasus | Broad Whitefish |
| 582 | Coregonus pidschian | Humpback Whitefish |
| 583 | Coregonus sardinella | Least Cisco |
| 584 | Coregonus autumnalis | Arctic Crisco |
| 585 | Prosopium cylindraceum | Round Whitefish |
| 590 | Lota lota | Burbot |
| 601 | Lampetra japonica | Arctic Lamprey |
| 610 | Thymallus arcticus | Arctic Grayling |
| 630 | Dallia pectoralis | Alaska Blackfish |
| 640 | Catostomus catostomus | Longnose Sucker |
| 661 | Pungitius pungitius | Ninespine Stickleback |
| 113 | Eleginus gracilis | Saffron Cod |
| 121 | Platichthys stellatus | Starry Flounder |
| 122 | Liopsetta Glacialis | Arctic Flounder |
| 166 | Oligocottus maculosus | Tidepool Sculpin |
| 200 | Hippoglossus stenolepis | Pacific Halibut |
| 230 | Clupea harenguspassasi | Pacific Herring |
| 516 | Mallotus villosus | Capelin |

1/ Based on Amercial Fisheries Society Special Publication No. 12, A List of Common and Scientific Names of Fishes from the United States and Canada (Fourth Edition). Committee on Names of Fishes, Bethesda, Maryland, 1980.

Appendix Table 9. Kuskokwim Area escapement index objectives for chinook, sockeye, coho and chum salmon, 1984.

| | Escapement Objective 1/ | | | |
|---|---|---|---|---|
| | Chinook | Sockeye | Coho | Chum |
| **KUSKOKWIM RIVER** | | | | |
| 1. Kwethluk River | | | | |
| a. 3-step Mt. to Canyon Cr. | 1.0 | - | - | 7.0 |
| b. Canyon Creek | 0.2 | - | - | - |
| 2. Kisaralik River | | | | |
| a. Airstrip to Kisaralik L. | 1.0 | - | - | 8.0 |
| b. Kasigluk R. (upper to lower) | 1.0 | - | - | 8.0 |
| 3. Tuluksak River (Fog R. to Bear Cr.) | 0.4 | - | - | 5.0 |
| 4. Aniak River | | | | |
| a. Buckstock R. to Aniak L. | 1.5 | - | - | 10.0 |
| b. Salmon River | 0.6 | - | - | 3.0 |
| c. Aniak Sonar Project 2/ | - | - | - | 250.0 |
| 5. Holitna River | | | | |
| a. Nogamut to Kashegelok | 20.0 | 1.0 | - | 49.0 |
| b. Kogrukluk Weir | 10.0 | 2.0 | 25.0 | 30.0 |
| 6. Salmon river (Pitka Fork) | 1.3 | - | - | - |
| **KUSKOKWIM BAY** | | | | |
| 1. Kanektok River and Kagati Lake | 5.8 | 32.0 | 25.0 | 54.0 |
| 2. Goodnews River System | | | | |
| a. Main Fork and lakes | 1.6 | 15.0 | 15.0 | 17.0 |
| b. Middle Fork and lakes | 0.8 | 5.0 | 2.0 | 4.0 |
| c. Middle Fork Tower Project 4/ | 3.5 | 40.0 | - | 15.0 |

1/ Escapement objectives in thousands of fish are preliminary and are subject to change as additional data becomes available. Unless otherwise indicated, escapement objectives are based on aerial index counts which do not represent total escapement, but do reflect annual spawner abundance trends when made using standard survey methods under acceptable survey conditions.

2/ Sonar total escapement estimates.

3/ Total Kogrukluk River escapement estimates.

4/ Tower total escapement estimate.

Appendix Table 10. Kuskokwim River distances 1/.

| | MOUTH KILOMETER | MOUTH MILES | DISTANCE FROM BETHEL KILOMETER | DISTANCE FROM BETHEL MILES |
|---|---|---|---|---|
| Kuskokwim River | | | | |
| Kuskokwim River Mouth 60.80 N, 162.42 W | 0 | 0 | -126 | -78 |
| Eek Island, North end 60 10' (boundry District 1) | 27 | 17 | - 99 | -62 |
| Eek River | 36 | 22 | -100 | -62 |
| Kwegooyuk | 38 | 24 | - 88 | -55 |
| Kinak River | 48 | 30 | - 78 | 49 |
| Tuntutuliak Village | 57 | 35 | - 88 | -54 |
| Kialik River | 60 | 37 | - 67 | -41 |
| Fowler Island | 84 | 52 | - 42 | -26 |
| Johnson River | 94 | 58 | - 32 | -20 |
| Napakiak Village | 104 | 65 | - 22 | -14 |
| Napaskiak Village | 115 | 71 | - 12 | - 7 |
| Oscarville Village | 115 | 72 | - 11 | - 7 |
| Bethel City | 126 | 78 | 0 | 0 |
| Gweek River | 145 | 90 | 19 | 12 |
| Kwethluk Village | 159 | 99 | 33 | 20 |
| Akiachuk Village | 169 | 105 | 43 | 27 |
| Kasigluk River | 175 | 108 | 48 | 30 |
| Kisaralik River | 176 | 109 | 50 | 31 |
| Akiak Village | 190 | 118 | 64 | 40 |
| Mishevik Slough (boundry Districts 1 and 2) | 198 | 123 | 71 | 44 |
| Tuluksak Village | 218 | 136 | 92 | 57 |
| Mud Creek Slough | 298 | 185 | 172 | 107 |
| Kalskag Village | 309 | 192 | 183 | 114 |
| Aniak Village, Aniak River | 362 | 225 | 236 | 147 |
| Chuathbaluk Village | 375 | 233 | 249 | 155 |
| Kolmakof River (boundary District 2) | 396 | 246 | 270 | 168 |
| Napaimiut Village | 410 | 255 | 284 | 176 |
| Holokuk River | 415 | 258 | 289 | 179 |
| Oskawalik River | 449 | 279 | 323 | 201 |
| Crooked Creek Village | 467 | 290 | 341 | 212 |
| Georgetown Village, George River | 497 | 309 | 371 | 230 |
| Red Devil Village | 526 | 327 | 400 | 249 |
| Sleetmute Village | 539 | 335 | 413 | 256 |
| Holitna River | 541 | 336 | 415 | 258 |
| Stony River Village | 585 | 364 | 459 | 285 |
| Stony River | 587 | 365 | 461 | 286 |
| Swift River | 612 | 380 | 486 | 302 |
| Tatlawisksuk River | 617 | 383 | 491 | 305 |
| Devil's Elbow | 645 | 401 | 519 | 323 |

Appendix Table 10. Kuskokwim River distances 1/ (continued).

| | MOUTH | | DISTANCE FROM BETHEL | |
|---|---|---|---|---|
| | KILOMETER | MILES | KILOMETER | MILES |
| Vinasale | 736 | 460 | 610 | 341 |
| McGrath Village | 881 | 507 | 685 | 428 |
| Middle Fork | 885 | 553 | 759 | 474 |
| Big River | 896 | 560 | 770 | 481 |
| Pitka Fork | 916 | 572 | 790 | 494 |
| Medfra Village | 923 | 577 | 797 | 499 |
| South Fork | 927 | 579 | 801 | 501 |
| East Fork | 938 | 586 | 812 | 508 |
| North Fork | 938 | 586 | 812 | 508 |
| Nikolai Village | 994 | 621 | 868 | 542 |
| Swift Fork | 1,129 | 706 | 1,003 | 627 |
| Telida Villages | 1,178 | 736 | 1,052 | 658 |
| Highpower Cr. | 1,193 | 746 | 1,068 | 667 |
| Fish Creek | 1,277 | 798 | 1,151 | 719 |
| North Fork Lake | 1,327 | 829 | 1,201 | 751 |
| Top of Kuskokwim Drainage | 1,490 | 931 | 1,364 | 852 |

1/ These distances were taken from the USGS 1:63,300 series of topographic maps. The "mouth" was defined as the point where the "grassland" banks are 24 miles apart.

Appendix Table 11. Associated Environmental and Catch Data, Kuskokwim River, 1965-1984. 1/

| YEAR | BREAKUP BETHEL | RIVER CLEAR OF ICE | FIRST REPORTED KING SALMON | FIRST REPORTED SMELT | FREEZE-UP AT BETHEL |
|---|---|---|---|---|---|
| 1965 | 2/ | 2/ | May 31 | May 25 | 2/ |
| 1966 | June 1 | 2/ | June 1 3/ | June 6 | Oct. 20 |
| 1967 | May 6 | May 17 | May 20 | May 25 | Oct. 19 |
| 1968 | May 14 | May 17 | May 26 | 2/ | 2/ |
| 1969 | May 6 | May 13 | May 23 | 2/ | 2/ |
| 1970 | May 12 | May 16 | May 21 | May 27 | Oct. 18 |
| 1971 | May 24 | May 29 | June 6 | June 7 | Nov. 4 |
| 1972 | May 23 | May 28 | June 5 | June 6 | Nov. 3 |
| 1973 | May 14 | May 18 | May 27 | May 31 | Oct. 15 |
| 1974 | May 7 | May 19 | May 23 | May 25 | 2/ |
| 1975 | May 19 | May 25 | May 26 | May 29 | Oct. 29 |
| 1976 | May 18 | May 28 | June 1 | 2/ | Oct. 27 |
| 1977 | May 23 | June 1 | May 31 | June 2 | Oct. 18 |
| 1978 | 2/ | 2/ | May 18 | May 22 | Oct. 25 |
| 1979 | Apr 27 | May 7 | May 16 | 2/ | Nov. 19 |
| 1980 | May 4 | May 10 | May 17 | May 22 | 2/ |
| 1981 | May 9 | May 12 | May 22 | May 6 | Nov. - |
| 1982 | May 18 | May 22 | June 1 | June 3 | Oct. 30 |
| 1983 | May 11 | May 13 | May 23 | June 1 | Oct. 22 |
| 1984 | May 13 | May 23 | May 27 | May 27 | Oct. 18 |

1/ Environmental data, breakup, clear of ice and freeze-up from National Weather Service.
2/ Data Not available
3/ Caught at Kalskag

Appendix Table 12. Utilization of Kuskokwim River chinook salmon, 1960-1984.

| YEAR | COMMERCIAL CATCH 1/ | SUBSISTENCE CATCH 2/ | TOTAL UTILIZATION | PREVIOUS FIVE YEAR AVERAGE |
|---|---|---|---|---|
| 1960 | 5,969 | 20,361 | 26,330 | |
| 1961 | 18,918 | 30,910 | 49,828 | |
| 1962 | 15,341 | 14,642 | 29,983 | |
| 1963 | 12,016 3/ | 37,246 | 29,262 | |
| 1964 | 17,149 3/ | 29,017 | 46,166 | |
| 1965 | 21,989 3/ | 27,143 | 49,132 | 40,313 |
| 1966 | 25,545 4/ | 49,606 | 75,151 | 44,874 |
| 1967 | 29,986 | 57,875 | 87,861 | 49,938 |
| 1968 | 34,278 | 30,230 | 64,508 | 61,514 |
| 1969 | 43,997 | 40,138 | 84,135 | 64,563 |
| 1970 | 39,290 | 69,204 | 108,494 | 72,157 |
| 1971 | 40,274 | 42,926 | 83,200 | 67,128 |
| 1972 | 39,454 | 40,145 | 79,599 | 85,639 |
| 1973 | 32,838 | 38,526 | 71,365 | 71,068 |
| 1974 | 18,664 | 26,665 | 45,329 | 85,358 |
| 1975 | 21,720 | 47,784 | 69,504 | 77,597 |
| 1976 | 30,735 | 58,185 | 88,920 | 69,799 |
| 1977 | 35,830 | 55,577 | 91,407 | 70,943 |
| 1978 | 45,641 | 35,881 | 81,522 | 73,305 |
| 1979 | 38,966 | 55,524 | 94,490 | 75,336 |
| 1980 | 35,881 | 59,900 | 95,781 | 85,169 |
| 1981 | 47,663 | 59,669 | 107,332 | 90,424 |
| 1982 | 48,234 | 53,310 | 101,544 | 94,106 |
| 1983 | 33,174 | 46,900 5/ | 80,074 | 96,133 |
| 1984 | 31,742 | 57,200 5/ | 88,942 | 95,844 |

1/ Districts 1, 2 and 3.
2/ Catches are expanded and include all village surveyed each year.
3/ District 2/3 boundry changed from Aniak to Kolmokoff River, no catch reported for District 3.
4/ District 3 eliminated.
5/ Estimate from limited survey.

Appendix Table 13. Peak aerial salmon escapement index counts, Kuskokwim Area, 1960-1984. 1/

| YEAR | INDEX COUNT 2/ CHINOOK | SOCKEYE | COHO | CHUM | AREA SURVEYED 3/ | RATING |
|---|---|---|---|---|---|---|
| **GOODNEWS RIVER** | | | | | | |
| 1959 | - | - | 4,100 | - | Entire | Fair |
| 1960 | 2,503 | 300 | - | 8,500 | Entire 3/ | Fair |
| 1961 | 1,780 | 900 | - | 2,325 | Entire | Fair |
| 1968 | 1,790 | - | 6,280 | 36,100 | Entire | Fair |
| 1975 | 829 | 3,335 | - | 1,090 | Mouth to Nimgum Creek | Fair |
| 1976 | 1,150 | 5,940 | - | 16,900 | Mouth to Slate Creek | Good |
| 1977 | 2,163 | 4,271 | - | 15,993 | Mouth to Goodnews Lake | Good |
| 1979 | 635 | 987 | - | 8,349 | Mouth to Goodnews Lake | Fair |
| 1980 | 1,228 | 30,239 | 23,671 | 1,975 | Mouth to Goodnews Lake | Fair |
| 1982 | 1,990 | 19,160 | - | 9,700 | Entire | Good |
| 1983 | 2,600 | 5,450 | - | - | Mouth to Goodnews Lake | Fair |
| 1984 | 2,002 | 12,307 | 43,925 | 28,124 | Mouth to Goodnews Lake | Fair |
| ALL YEARS AVERAGE | 1,697 | 8,289 | 19,494 | 12,806 | | |
| **KANEKTOK RIVER** | | | | | | |
| 1960 | 6,047 | 34,900 | 420 | 36,100 | Entire | Fair |
| 1962 | 935 | 43,108 | - | - | Entire | Fair |
| 1966 | 3,718 | - | - | 28,800 | Entire | Fair |
| 1968 | 4,170 | 8,000 | 4,765 | 69,760 | Entire | Fair |
| 1970 | 3,112 | 1,900 | - | 69,000 | Lake to Mile 20 | Fair |
| 1976 | 3,079 | 2,936 | - | 6,197 | Entire | Fair |
| 1977 | 5,787 | 6,304 | - | 32,157 | Entire | Fair |
| 1978 | 19,180 | 44,215 | - | 229,290 | Entire | Fair |
| 1980 | 6,172 | 113,931 | 69,325 | 25,950 | Entire | Good |
| 1981 | 15,900 | 49,175 | - | 66,849 | Entire | Fair |
| 1982 | 8,142 | 55,950 | 9,700 | 8,820 | Entire | Fair |
| 1983 | 8,890 | 2,340 | - | 9,360 | Entire | Fair |
| 1984 | 11,282 | 30,910 | 46,830 | 48,360 | Entire | Fair |
| ALL YEARS AVERAGE | 7,416 | 32,806 | 26,208 | 52,554 | | |
| **KWETHLUK RIVER** | | | | | | |
| 1960 | 1,320 | - | - | 1,300 | Upper 40 Miles | Fair |
| 1966 | 516 | - | - | 1,300 | Upper 35 Miles | Fair |
| 1968 | 800 | - | - | 3,900 | Entire | Fair |
| 1976 | 997 | - | - | 7,576 | Devil's Elbow to Canyon Creek | Fair |
| 1977 | 1,999 | - | - | 19,621 | 3 Step Mt. to Canyon Crk | Fair |

Appendix Table 13. Peak aerial salmon escapement index counts, Kuskokwim Area, 1960-1984 (continued) 1/

| YEAR | INDEX COUNT 1/ CHINOOK | SOCKEYE | COHO | CHUM | AREA SURVEYED 3/ | RATING |
|---|---|---|---|---|---|---|
| KWETHLUK RIVER (con't) | | | | | | |
| 1978 | 1,722 | - | - | 3,220 | 3 Step Mt. to Canyon Crk | Fair |
| 1979 | 822 | - | - | 4,739 | 3 Step Mt. to Canyon Crk | Fair |
| 1981 | 2,034 | - | - | 5,496 | Entire | Fair |
| 1983 | 471 | - | 809 | 6,432 | 3 Step Mt. to include Canyon Creek | Fair |
| 1984 | 273 | 150 | - | 1,636 | 3 Step Mt. to include Canyon Creek | Fair |
| ALL YEARS AVERAGE | 1,095 | 150 | 809 | 5,522 | | |
| KISARALIK RIVER | | | | | | |
| 1959 | - | - | 100 | - | Entire | Fair |
| 1960 | 1,104 | - | - | 2,300 | Entire | Fair |
| 1968 | 487 | - | - | 5,800 | Upper River | Fair |
| 1970 | 531 | - | - | 4,410 | Airstrip to Quicksilver Creek | Fair |
| 1973 | 152 | - | - | 861 | Airstrip-1 mile Abv falls | Fair |
| 1976 | 873 | - | 1 | 10,921 | 10 Mi. Blw Foothills-Lake | Fair |
| 1978 | 2,417 | 20 | - | 2,100 | Airstrip to Lake | Fair |
| 1981 | 940 | - | - | 7,508 | Entire | Fair |
| 1982 | 81 | - | - | 40 | Entire | Fair |
| 1983 | 476 | - | 406 | 3,060 | Entire | Fair |
| 1984 | 157 | 28 | - | 701 | Entire | Fair |
| ALL YEARS AVERAGE | 722 | 24 | 169 | 3,770 | | |
| ANIAK RIVER | | | | | | |
| 1960 | 1,881 | - | - | 35,900 | Entire | Fair |
| 1961 | 497 | - | - | 352 | Entire | Fair |
| 1962 | 925 | - | - | 36,253 | Entire | Fair |
| 1966 | 2,184 | - | - | 5,681 | Buckstock to Lake | Fair |
| 1968 | 2,203 | - | - | 128,390 | Buckstock to Kipchuk | Fair |
| 1970 | 1,231 | - | - | 17,575 | Buckstock to Waterboot | Fair |
| 1975 | 202 | 125 | - | 12,025 | Entire | Fair |
| 1976 | 281 | - | 36 | 8,385 | Kipchuk to Gemuk Mtn. | Fair |
| 1978 | - | - | 140 | - | Entire | Fair |
| ANIAK | | | | | | |
| 1980 | - | - | 7,035 | - | Entire | Fair |
| 1981 | 10,094 | - | - | 97,275 | Entire | Fair |

Appendix Table 13. Peak aerial salmon escapement index counts, Kuskokwim Area, 1960-1984 (continued) 1/

| YEAR | INDEX COUNT 1/ CHINOOK | SOCKEYE | COHO | CHUM | AREA SURVEYED 3/ | RATING |
|---|---|---|---|---|---|---|
| ANIAK (con't) | | | | | | |
| 1982 | 2,210 | 20 | 0 | 31,990 | Entire | Fair |
| 1983 | 2,149 | 50 | 765 | 10,091 | Entire | Fair |
| 1984 | 814 | 200 | - | 9,139 | Entire | Fair |
| ALL YEARS AVERAGE | 2,056 | 99 | 1,994 | 32,754 | | |
| SALMON RIVER (ANIAK) | | | | | | |
| 1960 | 223 | - | - | 50 | Entire | Good |
| 1970 | 381 | - | - | 3,505 | Lower 25 Miles | Fair |
| 1974 | 35 | - | - | 312 | Entire | Good |
| 1975 | 32 | - | - | 1,620 | Entire | Fair |
| 1976 | - | 25 | 31 | - | Entire | Fair |
| 1977 | 520 | - | - | 625 | Mouth to Marvel | Fair |
| 1978 | 322 | - | 151 | 330 | Entire | Fair |
| 1980 | 1,186 | - | 412 | 14,815 | Mouth to Cripple | Fair |
| 1981 | 828 | - | - | 2,380 | Entire | Fair |
| 1982 | 126 | 30 | - | 175 | Entire | Fair |
| 1983 | 231 | - | - | 992 | Entire | Fair |
| 1984 | 13 | - | - | 100 | Lower 25 miles | Poor |
| ALL YEARS AVERAGE | 354 | 27 | 198 | 2,264 | | |
| KIPCHUK RIVER | | | | | | |
| 1960 | 513 | - | - | 70 | Entire | Good |
| 1966 | 491 | - | - | 3,132 | Lower 22 Miles | Good |
| 1967 | 319 | - | - | 3,000 | Entire | Fair |
| 1970 | 821 | - | - | 5,807 | Mouth to bulldog | Fair |
| 1974 | 75 | - | - | 45 | Entire | Good |
| 1975 | 94 | - | - | 905 | Entire | Fair |
| 1976 | 177 | - | - | 1,425 | Mouth to Big Bend | Fair |
| 1978 | - | - | 11 | - | Entire | Fair |
| 1980 | 193 | - | 209 | 1,260 | Entire | Fair |
| 1984 | - | 20 | - | - | Incidental observation | - |
| ALL YEARS AVERAGE | 335 | 20 | 110 | 1,956 | | |

Appendix Table 13. Peak aerial salmon escapement index counts, Kuskokwim Area, 1960-1984 (continued) 1/

| YEAR | INDEX COUNT 2/ CHINOOK | SOCKEYE | COHO | CHUM | AREA SURVEYED 3/ | RATING |
|---|---|---|---|---|---|---|
| **CHUKOWAN RIVER** | | | | | | |
| 1966 | 986 | - | - | 153 | Mouth to Gemuk River | Good |
| 1968 | 1,260 | - | - | 1,000 | Mouth to Gemuk River | Fair |
| 1970 | 1,118 | 75 | - | 1,900 | Mouth to Gemuk River | Good |
| 1973 | 229 | - | - | 15 | Mouth to Gemuk River | Fair |
| 1975 | 667 | 184 | - | 550 | Mouth to Gemuk River | Fair |
| 1976 | 727 | 76 | - | 696 | Entire | Fair |
| 1978 | 1,064 | - | - | 172 | Mouth to Enatalik | Good |
| 1982 | 236 | 1,372 | 6 | 180 | Entire | Fair |
| ALL YEARS AVERAGE | 786 | 427 | 6 | 583 | | |
| **SALMON RIVER (PITKA FORK)** | | | | | | |
| 1976 | 1,149 | - | - | - | Middle Fork | Good |
| 1977 | 1,930 | - | - | - | Entire | Good |
| 1978 | 1,083 | - | - | - | Entire | Good |
| 1979 | 667 | - | - | - | Entire | Fair |
| 1980 | 1,450 | - | 89 | - | Entire | Fair |
| 1981 | 1,474 | - | - | - | Entire | Fair |
| 1982 | 419 | - | - | - | Entire | Fair |
| 1983 | 572 | - | - | - | Entire | Fair |
| 1984 | 572 | - | - | - | Entire | Fair |
| ALL YEARS AVERAGE | 1,035 | - | 89 | - | | |
| **KOGRUKLUK RIVER** | | | | | | |
| 1961 | 214 | 70 | - | - | Entire | Fair |
| 1966 | 1,645 | 85 | - | 538 | Entire | Good |
| 1968 | 2,180 | - | - | 3,540 | Entire | Fair |
| 1970 | 1,598 | 315 | - | 4,150 | Entire | Fair |
| 1972 | 476 | - | - | 850 | Entire | Fair |
| 1975 | 1,080 | 646 | - | 3,973 | Entire | Fair |
| 1976 | 702 | 97 | - | 378 | Tower to Marker | Fair |
| 1977 | 1,342 | 614 | - | 606 | Entire | Good |
| 1980 | 540 | 980 | - | 3,500 | Entire | Fair |
| ALL YEARS AVERAGE | 1,086 | 401 | - | 2,192 | | |

APPENDIX TABLE 13. Peak aerial salmon escapement index counts, Kuskokwim Area, 1960-1984 (continued) 1/

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1/ Only years rated fair or good are included.
2/ Not to be considered an escapement estimate.
3/ Entire does not include turbid part of a stream near its mouth.

APPENDIX TABLE 14. Historic salmon escapement data from current Kuskokwim Area projects.

| YEAR | OPERATING PERIOD | CHINOOK | SOCKEYE | COHO 2/ | PINK 1/ | CHUM |
|---|---|---|---|---|---|---|
| KOGRUGLUK WEIR | | | | | | |
| 1976 | 06/29 to 07/31 | 5,507 | 2,302 | 3/ | - | 8,046 |
| 1977 | 07/14 to 07/27 | 2,548 | 2,238 | 3/ | 2 | 21,746 |
| 1978 | 06/28 to 07/31 | 13,132 | 1,656 | 3/ | 2 | 47,099 |
| 1979 | 07/01 to 07/24 | 11,063 | 2,589 | 3/ | 1 | 15,277 |
| 1980 | 07/01 to 07/11 | 6,572 | 3,200 | 3/ | 1 | 41,777 |
| 1981 | 06/27 to 10/05 | 16,075 | 17,702 | 11,532 | 6 | 56,495 |
| 1982 | 07/09 to 09/14 | 10,990 | 20,654 | 38,961 | 19 | 51,853 |
| 1983 | 06/22 to 07/02 | 3,009 | 1,147 | 8,327 | - | 8,997 |
| 1984 | 06/19 to 09/15 | 4,928 | 4,130 | 29,824 | - | 41,484 |
| ANIAK SONAR 4/ | | | | | | |
| 1980 | 06/22 to 07/30 | 56,469 | - | - | - | 1,091,286 |
| | 08/16 to 09/12 | - | - | 81,566 | - | - |
| 1981 | 06/15 to 08/06 | 42,060 | - | - | - | 526,320 |
| 1982 | 06/21 to 08/01 | 33,864 | - | - | - | 389,226 |
| 1983 | 06/18 to 07/28 | 4,911 | - | - | - | 114,869 |
| 1984 | 06/16 to 07/30 | - | - | - | - | 254,872 |
| MIDDLE FORK | | | | | | |
| GOODNEWS RIVER TOWER | | | | | | |
| 1981 | 06/13 to 08/15 | 3,688 | 49,108 | 357 | 1,327 | 21,827 |
| 1982 | 06/23 to 08/03 | 1,395 | 56,255 | 62 | 13,855 | 6,767 |
| 1983 | 06/11 to 07/28 | 6,027 | 25,816 | 3/ | 34 | 15,548 |
| 1984 | 06/15 to 07/31 | 3,260 | 32,053 | 249 | 13,744 | 19,003 |

1/ Kogrukluk Weir does not control the passage of pink salmon
2/ Weir did not operate during the coho salmon migration.
3/ No count or incomplete count as project is not operated during entire coho salmon migration.
4/ Aniak sonar counts are adjusted to provide the total estimated escapements presented here.

Appendix Table 15. Utilization of Kuskokwim River chum salmon, 1960-1984.

| YEAR | COMMERCIAL CATCH 1/ | SUBSISTENCE CATCH 2/ | TOTAL UTILIZATION | PREVIOUS FIVE YEAR AVERAGE |
|---|---|---|---|---|
| 1960 | | 327,297 | 327,297 | |
| 1961 | | 185,447 | 185,447 | |
| 1962 | | 165,626 | 165,626 | |
| 1963 | | 141,550 | 141,550 | |
| 1964 | | 189,660 | 189,660 | |
| 1965 | | 283,459 | 283,459 | 201,916 |
| 1966 | | 174,660 | 174,660 | 193,148 |
| 1967 | 148 | 205,263 | 205,411 | 190,991 |
| 1968 | 187 | 260,023 | 260,210 | 190,991 |
| 1969 | 7,165 | 198,268 | 205,793 | 222,680 |
| 1970 | 1,664 | 245,550 | 247,214 | 225,906 |
| 1971 | 68,914 | 116,391 | 185,305 | 218,657 |
| 1972 | 78,619 | 120,316 | 198,935 | 220,786 |
| 1973 | 143,746 | 179,259 | 328,005 | 219,491 |
| 1974 | 171,887 | 277,170 | 449,057 | 233,050 |
| 1975 | 181,840 | 176,389 | 358,229 | 281,703 |
| 1976 | 177,864 | 227,765 | 405,269 | 303,906 |
| 1977 | 248,721 | 213,418 | 462,139 | 347,899 |
| 1978 | 248,656 | 131,049 | 379,706 | 400,539 |
| 1979 | 261,874 | 160,836 | 422,710 | 410,880 |
| 1980 | 483,751 | 163,196 | 646,947 | 405,611 |
| 1981 | 418,677 | 153,766 | 572,443 | 463,354 |
| 1982 | 278,306 | 190,036 | 468,432 | 496,789 |
| 1983 | 276,698 | 130,500 3/ | 407,198 | 498,048 |
| 1984 | ~~423,718~~ 351,718 | 149,300 3/ | 573,018 | 503,546 |
| Previous Five Year Average (1979-1983) | 343,861 | 159,667 | 503,546 | |

1/ District W-1 and W-2.
2/ Includes minimal numbers of red, pink and coho salmon. Does not include coho that were accurately identified in the subsistence catch.
3/ Estimte based on limited survey.

Appendix Table 16. Kuskokwim River subsistence chinook salmon catches by village, 1960-1984.

| VILLAGE | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 |
|---|---|---|---|---|---|---|---|---|---|---|
| Kwigillingok, Kipnuk, Kongiganak | 250 | 282 | 54 | 229 | 414 | 0 1/ | 205 | 957 | 70 | 385 |
| Eek | 1,474 3/ | 2,238 3/ | 1,060 3/ | 2,697 3/ | 1,857 | 2,872 | 2,872 | 4,375 | 2,760 | 2,037 |
| Tuntutuliak | 226 | 2,226 | 842 | 3,853 | 1,826 | 1,978 | 3,061 | 3,338 | 2,026 | 2,195 |
| Kasigluk | 135 | 1,215 | 127 | 1,302 | 4/ | 513 | 1,875 | 2,766 | 1,360 | 2,279 |
| Nunapitchuk | 683 | 2,042 | 848 | 1,874 | 626 | 490 | 2,875 | 1,926 | 1,360 | 2,279 |
| Atmauthluak 6/ | | | | | | | | | | |
| Napakiak | 1,830 | 2,573 | 2,191 | 3,148 | 2,677 | 1,670 | 3,592 | 3,922 | 2,317 | 3,546 |
| Oscarville | 1,968 | 282 | 75 | 309 | 339 | 678 | 301 | 1,327 | 393 | 457 |
| Napaskiak | 536 | 1,258 | 759 | 1,569 | 2,201 | 1,412 | 2,935 | 3,091 | 1,647 | 2,227 |
| Bethel | 1,923 | 4,150 | 1,378 | 7,019 | 4,114 | 3,342 | 7,604 | 11,772 | 4,900 | 7,472 |
| Kwethluk | 2,692 | 3,763 | 2,329 | 5,050 | 3,262 | 4,538 | 6,135 | 6,889 | 3,549 | 3,187 |
| Akiakchak | 1,626 | 3,052 | 1,800 | 2,533 | 3,488 | 3,952 | 4,957 | 5,543 | 3,415 | 2,602 |
| Akiak | 1,865 | 3,159 | 906 | 2,869 | 2,495 | 1,774 | 3,941 | 3,790 | 1,332 | 1,275 |
| Tuluksak | 737 | 1,486 | 493 | 1,295 | 572 | 1,019 | 1,559 | 1,710 | 1,048 | 1,131 |
| Lower Kalskag | 961 | 571 | 805 | 2,661 | 710 | 841 | 1,918 | 1,733 | 1,463 | 2,083 |
| Upper Kalskag | 667 | 1,049 | 7/ | 7/ | 1,143 | 719 | 1,333 | 1,699 | 1,404 | 1,623 |
| Aniak | 1,057 | 688 | 185 | 602 | 1,104 | 494 | 2,002 | 1,415 | 467 | 1,406 |
| Chuathbaluk | 64 | 54 | 10 | 30 | 74 | 29 | 139 | 217 | 40 | 180 |
| Napamute | 20 | 16 | 44 | 52 | 134 | 2 | 78 | 60 | 100 | 19 |
| Crooked Creek | 747 | 518 | 561 | 859 | 1,358 | 363 | 1,249 | 638 | 77 | 541 |
| Georgetown | ND | ND | ND | ND | ND | ND | 12 | ND | ND | 9 |
| Red Devil | ND | 40 | 144 9/ | 228 9/ | 314 9/ | ND | 182 | ND | 111 | 142 |
| Sleetmute | 465 | 222 | ND | ND | ND | 491 | 149 | 343 | 200 | 267 |
| Stony River | 435 | 25 | 31 | 78 | 200 | 101 | 732 | 364 | 191 | 2,187 |
| TOTAL | 20,361 | 30,910 | 14,642 | 37,246 | 29,017 | 27,143 | 49,606 | 57,875 | 30,230 | 40,138 |

Appendix Table 16. Kuskokwim River subsistence chinook salmon catches by village, 1960-1984 (continued).

| VILLAGE | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|
| Kwigillingok, Kipnuk, Kongiganak | 1,111 | 241 | ND | 75 | ND | ND | 197 | 743 | 75 | ND |
| Eek | 2,065 | 1,822 | 1,969 | 1,981 | 2,356 | 2,110 | 3,232 | 2,675 | 1,807 | 2,003 |
| Tuntutuliak | 3,558 | 1,841 | 3,214 | 2,859 | 1,577 | 3,492 | 4,807 | 2,470 | 1,656 | 2,268 |
| Kasigluk | 3,931 | 1,645 | 1,292 | 8,864 | 1,411 | 1,713 | 1,613 | 1,324 | 608 | 1,142 |
| Nunapitchuk | 4,680 | 1,940 | 2,496 | 2,663 | 1,165 | 2,092 | 2,578 | 2,622 | 2,178 | 2,109 |
| Atmauthluak 6/ | 1,205 | 548 | 864 | 1,106 | 382 | 1,042 | 1,169 | 1,015 | 966 | 2,242 |
| Napakiak | 4,960 | 1,868 | 2,009 | 1,763 | 1,224 | 2,864 | 3,330 | 2,702 | 2,140 | 2,191 |
| Oscarville | 543 | 570 | 196 | 586 | 180 | 891 | 623 | 672 | 349 | 629 |
| Napaskiak | 3,446 | 1,916 | 1,578 | 2,048 | 900 | 2,303 | 3,655 | 1,989 | 2,122 | 2,085 |
| Bethel | 17,026 | 8,731 | 8,371 | 8,898 | 4,631 | 11,688 | 13,215 | 9,408 | 6,905 | 11,564 |
| Kwethluk | 7,932 | 5,564 | 5,137 | 3,444 | 2,694 | 3,179 | 4,193 | 5,563 | 3,172 | 6,919 |
| Akiakchak | 7,022 | 4,818 | 3,872 | 2,592 | 1,726 | 3,534 | 4,915 | 5,407 | 2,951 | 4,818 |
| Akiak | 3,290 | 2,688 | 1,899 | 1,895 | 1,292 | 2,837 | 3,076 | 2,880 | 1,850 | 3,567 |
| Tuluksak | 1,995 | 1,280 | 1,318 | 1,322 | 883 | 1,338 | 1,441 | 2,906 | 1,906 | 1,489 |
| Lower Kalskag | 2,196 | 2,355 | 2,604 | 1,309 | 1,586 | 2,755 | 4,536 | 1,750 | 1,951 | 2,821 |
| Upper Kalskag | 734 | 601 | 401 | 938 | 463 | 1,752 | 1,431 | 2,013 | 1,253 | 1,590 |
| Aniak | 2,136 | 1,076 | 2,105 | 1,030 | 1,952 | 1,391 | 1,490 | 4,991 | 1,331 | 2,634 |
| Chuathbaluk | 219 | 179 | 261 | 942 | 674 | 594 | 657 | 1,507 | 1,238 | 2,189 |
| Napamute | 22 | 17 | 20 | 13 | 6 | 16 | 420 | 176 | 144 | 149 |
| Crooked Creek | 684 | 291 | 183 | 269 | 650 | 238 | 264 | 619 | 488 | 728 |
| Georgetown | 2 | 0 | 0 | 0 | ND | 0 | 0 | 66 | 0 | 0 |
| Red Devil | 252 | 135 | 182 | 138 | 205 | 623 | 195 | 324 | 153 | 488 |
| Sleetmute | 161 | 181 | 69 | 504 | 269 | 256 | 356 | 684 | 456 | 988 |
| Stony River | 105 | 2,521 10/ | 95 | 287 | 429 | 861 | 653 10/ | 33 | 182 | 171 |
| TOTAL | 69,204 | 42,926 | 40,145 | 45,526 | 26,665 | 47,569 | 57,917 | 55,339 | 35,991 | 54,708 |

Appendix Table 16. Kuskokwim River subsistence chinook salmon catches by villages, 1960-1984 (continued).

| VILLAGE | 1980 | 1982 | 1982 | 1983 | 1984 | PREVIOUS 5 YR. AVERAGE |
|---|---|---|---|---|---|---|
| Kwigillingok, Kipnuk, Kongignak | ND | ND | 112 | ND | ND | ND |
| Eek | 1,557 | 1,731 | 2,578 | 2,040 | ND | ND |
| Tuntutuliak | 2,545 | 4,466 | 1,984 | 2,523 | 3,519 | 2,757 |
| Kasigluk | 1,704 | 3,377 | 3,155 | ND | ND | ND |
| Nunapitchuk | 2,612 | 2,918 | 2,577 | 2,688 | ND | 2,581 |
| Atmauthluak 6/ | 1,288 | 1,247 | 1,752 | ND | ND | ND |
| Napakiak | 2,582 | 3,017 | 3,500 | 2,047 | ND | 2667 |
| Oscarville | 477 | 492 | 523 | ND | ND | ND |
| Napaskiak | 3,160 | 2,911 | 2,872 | ND | ND | ND |
| Bethel | 12,591 | 15,378 | 13,516 | 8,492 | 11,066 | 12,306 |
| Kwethluk | 7,627 | 6,167 | 5,897 | ND | 6,732 | ND |
| Akiakchak | 5,405 | 3,094 | 4,468 | ND | 5,588 | ND |
| Akiak | 3,355 | 2,380 | 2,745 | ND | 3,413 | ND |
| Tuluksak | 2,807 | 2,446 | 2,220 | 1,671 | 2,286 | 2,127 |
| Lower Kalskag | 3,917 | 3,271 | 2,594 | ND | 3,242 | ND |
| Upper Kalskag | 1,889 | 1,171 | 963 | ND | 657 | ND |
| Aniak | 2,750 | 3,102 | 2,071 | 3,174 | 1,847 | 2,746 |
| Chuathbaluk | 1,507 | 841 | 1,503 | 12/ ND | ND | ND |
| Napamute | 90 | 45 | 138 | ND | ND | ND |
| Crooked Creek | 654 | 512 | 515 | ND | ND | ND |
| Georgetown | 93 | ND | ND | ND | ND | ND |
| Red Devil | 255 | 298 | 273 | ND | ND | ND |
| Sleetmute | 227 | 728 | 180 | 12/ ND | 154 | ND |
| Stony River | 332 | 233 | 419 | ND | ND | ND |
| TOTAL | 59,509 | 59,669 | 56,515 | 46,888 | 11/ 57,206 | 11/ 55,458 |

Appendix Table 16. Kuskokwim River subsistence chinook salmon catches by village, 1960-1984, (continued).

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1/ Included with other villages.
2/ Does not include 1965.
3/ Estimtes based on catch data through 1969.
4/ Included with Eek.
5/ Does not include 1964.
6/ New village of Atmauthluak segregated in 1970 from parent village of Nunapitchuk.
7/ Included with Lower Kalskag
8/ Does not include 1962 and 1963.
9/ Includes Sleetmute.
10/ Includes Lime Village
11/ Estimate from Tables 8 and 9.
12/ Charnley, 1984.

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-1984.

| VILLAGE | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 |
|---|---|---|---|---|---|---|---|
| Kipnuk, Kongiganak and Kwigillingok | 1,430 | 3,279 | 1,990 | 2,562 | 2,323 | 0 | 680 |
| Eek | 4,094 | 2,321 3/ | 2,072 | 1,771 3/ | 3,151 | 2,898 | 1,324 |
| Tuntutuliak | 4,101 | 8,526 | 9,692 | 6,791 | 8,421 | 18,993 | 9,747 |
| Kasigluk | 1,400 | 3,657 | 1,705 | 1,020 | - 4/ | 4,041 | 3,058 |
| Nunapitchuk | 2,743 | 4,868 | 7,474 | 2,462 | 1,171 | 4,251 | 4,145 |
| Atmauthlauk | | | | | | | |
| Napkiak | 19,888 | 5,789 | 6,167 | 3,711 | 12,312 | 12,928 | 9,275 |
| Oscarville | 3,948 | 1,680 | 1,723 | 1,025 | 487 | 8,010 | 407 |
| Napaskiak | 5,199 | 4,286 | 5,546 | 3,584 | 6,275 | 26,206 | 8,743 |
| Bethel | 12,972 | 12,845 | 8,470 | 8,623 | 15,623 | 19,009 | 14,011 |
| Kwethluk | 32,975 | 21,106 | 22,788 | 13,180 | 19,186 | 37,780 | 18,707 |
| Akiakchak | 15,932 | 12,518 | 10,521 | 6,725 | 10,096 | 25,138 | 15,049 |
| Akiak | 13,601 | 8,205 | 6,551 | 8,478 | 9,659 | 12,297 | 10,622 |
| Tuluksak | 19,261 | 7,928 | 8,526 | 10,289 | 9,777 | 12,820 | 11,670 |
| Lower Kalskag | 11,563 | 7,764 | 16,478 | 23,249 | 9,472 | 21,906 | 10,346 |
| Upper Kalskag | 38,938 | 27,149 | - 5/ | - 5/ | 11,391 | 11,970 | 6,236 |
| Aniak | 36,673 | 15,935 | 10,120 | 10,608 | 17,874 | 11,353 | 12,484 |
| Chuathbaluk | 22,370 | 2,922 | 3,784 | 2,629 | 5,059 | 6,507 | 5,625 |
| Napamute | 11,017 | 6,235 | 3,898 | 5,192 | 4,873 | 704 | 3,704 |
| Crooked Creek | 41,263 | 17,558 | 27,259 | 23,166 | 32,550 | 18,968 | 19,467 |
| Georgetown | 6/ | 6/ | 6/ | 6/ | 6/ | 6/ | 70 |
| Red Devil | 6/ | 1,358 | 9,007 | 5,637 | 5,706 | 6/ | 2,746 |
| Sleetmute | 7,259 | 6,884 | 7/ | 7/ | 7/ | 11,707 | 2,611 |
| Stony River | 11,750 | 2,642 | 1,855 | 1,110 | 4,254 | 15,865 | 3,933 |
| TOTALS | 327,297 | 185,447 | 165,626 | 141,550 | 189,660 | 283,459 | 174,660 |

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-1984 (continued).

| VILLAGE | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|---|
| Kipnuk, Kongiganak and Kwigillingok | 2,846 | 2,800 | 2,481 | 3,937 | 1,110 | 1,284 | 807 |
| Eek | 1,922 | 3,503 | 3,436 | 4,855 | 2,213 | 783 | 2,401 |
| Tuntutuliak | 11,531 | 14,090 | 17,462 | 10,600 | 9,964 | 11,103 | 13,572 |
| Kasigluk | 2,309 | 4,311 | 3,308 | 5,731 | 2,043 | 1,934 | 6,090 |
| Nunapitchuk | 6,278 | 7,731 | 6,934 | 11,412 | 3,375 | 5,600 | 7,663 |
| Atmauthluak | | | 1,191 | 1,197 | 947 | 2,818 | |
| Napakiak | 12,685 | 12,700 | 12,390 | 16,371 | 4,427 | 5,191 | 8,461 |
| Oscarville | 2,580 | 2,104 | 2,743 | 4,669 | 1,675 | 498 | 3,081 |
| Napaskiak | 8,585 | 12,409 | 11,655 | 11,169 | 7,039 | 8,858 | 8,478 |
| Bethel | 14,055 | 28,603 | 14,613 | 33,475 | 9,905 | 16,885 | 33,930 |
| Kwethluk | 23,872 | 36,645 | 23,462 | 27,702 | 13,941 | 11,721 | 19,565 |
| Akiakchak | 13,584 | 19,461 | 10,306 | 29,776 | 12,298 | 9,266 | 9,864 |
| Akiak | 9,332 | 13,775 | 9,854 | 13,003 | 9,264 | 5,108 | 6,118 |
| Tuluksak | 8,898 | 11,114 | 6,058 | 7,626 | 6,115 | 5,145 | 5,946 |
| Lower Kalskag | 16,018 | 8,114 | 8,468 | 11,158 | 3,509 | 3,490 | 2,873 |
| Upper Kalskag | 8,364 | 9,733 | 9,413 | 5,309 | 3,530 | 1,460 | 5,607 |
| Aniak | 16,788 | 17,341 | 15,127 | 10,030 | 4,933 | 5,243 | 13,547 |
| Chuathbaluk | 7,249 | 11,588 | 7,523 | 10,971 | 5,632 | 8,509 | 14,171 |
| Napamute | 5,750 | 1,774 | 1,453 | 1,224 | 1,862 | 4,465 | 3,451 |
| Crooked Creek | 14,365 | 12,704 | 6,810 | 9,216 | 3,094 | 3,658 | 1,981 |
| Georgetwon | 6/ | 2,030 | 3,664 | 800 | 0 | 0 | 10 |
| Red Devil | 6/ | 2,400 | 1,130 | 2,454 | 1,067 | 1,695 | 2,782 |
| Sleetmute | 6,875 | 11,218 | 8,258 | 4,464 | 3,203 | 4,293 | 2,160 |
| Stony River | 11,377 | 13,875 | 12,080 | 8,407 | 5,995 | 3,000 | 3,875 |
| TOTALS | 205,263 | 260,023 | 198,268 | 245,550 | 116,391 | 120,316 | 179,259 |

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-1984 (continued).

| VILLAGE | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|
| Kongiganak, Kipnuk and Kwigillingok | 9/ | 9/ | 902 | 2,190 | 78 | 0 |
| Eek | 4,227 | 2,754 | 4,425 | 3,251 | 1,874 | 1,125 |
| Tuntutuliak | 28,321 | 7,429 | 8,440 | 9,340 | 5,564 | 5,632 |
| Kasigluk | 6,773 | 3,708 | 4,050 | 3,504 | 1,242 | 2,617 |
| Nunapitchuk | 12,498 | 5,447 | 6,551 | 8,991 | 4,977 | 5,737 |
| Atmauthluak | 4,585 | 2,524 | 3,446 | 3,693 | 3,860 | 5,287 |
| Napakiak | 21,494 | 11,630 | 9,477 | 8,420 | 6,074 | 8,019 |
| Oscarville | 5,617 | 3,237 | 2,416 | 2,030 | 1,276 | 969 |
| Napaskiak | 20,467 | 12,930 | 21,518 | 11,588 | 9,286 | 5,773 |
| Bethel | 34,882 | 26,808 | 26,970 | 15,982 | 13,731 | 31,040 |
| Kwethluk | 39,747 | 19,183 | 27,120 | 28,193 | 14,038 | 16,861 |
| Akiachak | 15,108 | 14,008 | 16,050 | 18,607 | 9,445 | 10,459 |
| Akiak | 18,434 | 18,890 | 12,337 | 13,952 | 9,237 | 12,218 |
| Tuluksak | 13,261 | 7,819 | 11,833 | 7,835 | 4,478 | 5,249 |
| Lower Kalskag | 12,265 | 9,823 | 17,169 | 8,964 | 3,704 | 9,134 |
| Upper Kalskag | 9,631 | 6,904 | 8,694 | 11,845 | 7,279 | 6,117 |
| Aniak | 9,305 | 9,597 | 13,507 | 21,610 | 8,042 | 15,274 |
| Chuathbaluk | 4,287 | 561 | 7,967 | 5,141 | 4,885 | 6,646 |
| Napamute | 76 | 226 | 1,653 | 4,969 | 1,887 | 2,103 |
| Crooked Creek | 4,954 | 2,461 | 3,236 | 3,072 | 2,469 | 3,141 |
| Georgetwon | 9/ | 9/ | 9/ | 1,127 | 9/ | 0 |
| Red Devil | 2,688 | 4,491 | 4,231 | 5,916 | 6,161 | 8,286 |
| Sleetmute | 4,212 | 5,761 | 7,628 | 6,674 | 7,917 | 8,262 |
| Stony River | 4,328 | 5,202 | 8,474 8/ | 3,300 | 3,545 | 3,355 |
| TOTALS | 277,170 | 176,389 | 228,104 | 210,194 | 131,049 | 149,147 |

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-1984 (continued).

| VILLAGE | 1980 | 1981 | 1982 | 1983 | 1984 | PREVIOUS 5 YEAR AVERAGE 10/ |
|---|---|---|---|---|---|---|
| Kongiganak, Kipnuk and Kwigillingok | 0 | 0 | 486 | N/A | N/A | N/A |
| Eek | 2,177 | 1,517 | 1,012 | 1,441 | N/A | N/A |
| Tuntutuliak | 8,961 | 5,943 | 8,500 | 3,585 | 5,103 | 6,524 |
| Kasigluk | 5,684 | 3,144 | 6,876 | N/A | N/A | N/A |
| Nunapitchuk | 6,626 | 5,501 | 8,646 | 7,137 | N/A | 6,729 |
| Atmauthluak | 4,794 | 3,856 | 4,787 | N/A | N/A | N/A |
| Napakiak | 8,123 | 7,099 | 8,618 | 3,120 | N/A | 6,372 |
| Oscarville | 1,395 | 1,260 | 1,665 | N/A | N/A | N/A |
| Napaskiak | 7,391 | 7,653 | 10,139 | N/A | N/A | N/A |
| Bethel | 33,198 | 42,798 | 37,857 | 20,267 | 18,863 | 33,032 |
| Kwethluk | 24,564 | 11,506 | 16,837 | N/A | 14,516 | N/A |
| Akiachak | 15,172 | 6,533 | 13,803 | N/A | 13,214 | N/A |
| Akiak | 10,596 | 11,718 | 9,339 | N/A | 8,027 | N/A |
| Tuluksak | 9,963 | 6,763 | 5,040 | 5,077 | 9,407 | 6,418 |
| Lower Kalskag | 8,903 | 4,625 | 6,925 | N/A | 8,886 | N/A |
| Upper Kalskag | 6,932 | 6,916 | 5,362 | N/A | 2,568 | N/A |
| Aniak | 14,067 | 13,494 | 14,946 | 23,549 | 8,849 | 16,661 |
| Chuathbaluk | 4,148 | 8,567 | 11,420 12/ | N/A | N/A | N/A |
| Napamute | 3,049 | 740 | 2,392 | N/A | N/A | N/A |
| Crooked Creek | 7,165 | 7,985 | 3,622 | N/A | N/A | N/A |
| Georgetown | 1,042 | 7/ | 9/ | N/A | N/A | N/A |
| Red Devil | 5,133 | 6,183 | 7,380 | N/A | N/A | N/A |
| Sleetmute | 10,934 | 9,805 | 2,936 | N/A | 2,208 | N/A |
| Stony River | 2,967 | 2,303 | 2,198 | N/A | N/A | N/A |
| TOTALS | 202,714 | 174,716 | 185,598 | (130,502) | (149,300) | 168,535 |

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-198 (continued).

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1/ Catches include a majority of chum salmon but include small numbers of red, coho, pink and small king salmon.
2/ 1965 to 1975 catches do not include late coho salmon catches..
3/ Estimate based on catch data through 1970.
4/ Included with Eek.
5/ Included with Lower Kalskag.
6/ Data not available.
7/ Included with Red Devil.
8/ Includes Lime Village.
9/ Surveys not conducted.
10/ 1979-1983.
11/ Harvest estimate see Tables 8 and 9.
12/ Charnley, 1984.

Appendix Table 18. Comparative chinook salmon catches by fishing period in District 1, Kuskokwim River. 1/

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/ HR. |
|---|---|---|---|---|---|
| 1974 | June 10-11 | 4,384 | 422 | 5,064 | 0.9 |
| | June 13-14 | 5,790 | 488 | 5,957 | 1.0 |
| | June 17-18 | 5,857 | 506 | 6,072 | 1.0 |
| Subtotal | 2/ | 16,031 | 606 | 16,992 | 0.9 |
| | June 27 | 558 | 267 | 1,602 | 0.4 |
| | July 01-02 | 561 | 380 | 4,560 | 0.08 |
| | July 04-05 | 196 | 282 | 3,384 | 0.06 |
| | July 08-09 | 286 | 376 | 4,512 | 0.06 |
| | July 18 | 31 | 190 | 1,140 | 0.03 |
| TOTAL | | 17,663 | 666 | 32,190 | 0.5 |
| 1975 | June 16 | 359 | 12 | 72 | 5.0 |
| | June 19-20 | 1,031 | 46 | 552 | 1.9 |
| | June 23-24 | 17,235 | 483 | 5,796 | 2.9 |
| Subtotal | 2/ | 18,625 | 541 | 6,420 | 2.9 |
| | June 30 | 691 | 279 | 1,674 | 0.4 |
| | July 03 | 636 | 360 | 2,160 | 0.3 |
| | July 07 | 421 | 369 | 2,214 | 0.2 |
| | July 10 | 195 | 304 | 1,824 | 0.1 |
| | July 14 | 179 | 326 | 1,956 | 0.1 |
| TOTAL | | 20,747 | 539 | 16,248 | 1.2 |
| 1976 | June 17 | 6,962 | 459 | 2,754 | 2.5 |
| | June 21 | 13,048 | 495 | 2,970 | 4.4 |
| Subtotal | 2/ | 20,010 | 954 | 5,724 | 3.4 |
| | June 28 | 4,143 | 348 | 2,088 | 2.0 |
| | July 01 | 1,550 | 415 | 2,490 | 0.6 |
| | July 08 | 894 | 381 | 2,286 | 0.4 |
| | July 12 | 377 | 344 | 2,262 | 0.2 |
| | July 15 | 236 | 265 | 1,590 | 0.1 |
| Totals | | 27,177 | 674 | 16,440 | 1.7 |

Appendix Table 18. Comparative chinook salmon catches by fishing period in District 1, Kuskokwim River. 1/

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/ HR. |
|---|---|---|---|---|---|
| 1977 | June 15 | 12,458 | 467 | 2,802 | 4.5 |
| | June 20 | 16,227 | 484 | 2,904 | 5.6 |
| Subtotal | 2/ | 28,685 | 563 | 5,706 | 5.0 |
| | June 27 | 1,337 | 378 | 2,268 | 0.6 |
| | June 30 | 504 | 409 | 2,454 | 0.2 |
| | July 04 | 266 | 331 | 1,986 | 0.1 |
| | July 07 | 407 | 368 | 2,208 | 0.2 |
| | July 14 | 153 | 385 | 2,310 | 0.06 |
| TOTAL | | 31,352 | 653 | 16,932 | 1.8 |
| 1978 | June 09 | 7,590 | 509 | 3,054 | 2.5 |
| | June 14 | 6,142 | 266 | 1,596 | 3.9 |
| | June 16 | 12,341 | 396 | 2,376 | 5.2 |
| | June 22 | 1,724 | 72 | 288 | 6.0 |
| | June 23 | 8,342 | 429 | 1,716 | 4.9 |
| Subtotal | 2/ | 36,139 | 615 | 9,030 | 4.0 |
| | June 26 | 1,964 | 499 | 2,694 | 0.7 |
| | June 29 | 1,759 | 422 | 2,652 | 0.7 |
| | July 03 | 894 | 476 | 2,856 | 0.3 |
| | July 06 | 1,460 | 485 | 5,820 | 0.3 |
| | July 10 | 694 | 428 | 5,136 | 0.1 |
| | July 13 | 293 | 422 | 2,532 | 0.1 |
| TOTAL | | 43,203 | 617 | 30,720 | 1.4 |
| 1979 | June 11 | 12,270 | 523 | 3,138 | 3.9 |
| | June 15 | 12,363 | 549 | 3,294 | 3.8 |
| Subtotal | 2/ | 24,633 | 591 | 6,432 | 3.8 |
| | June 22 | 5,651 | 502 | 3,012 | 1.9 |
| | June 26 | 2,277 | 531 | 3,186 | 0.7 |
| | June 29 | 1,583 | 542 | 3,252 | 0.3 |
| | July 03 | 1,233 | 542 | 3,252 | 0.4 |
| | July 10 | 470 | 520 | 3,120 | 0.2 |
| TOTAL | | 35,847 | 617 | 22,254 | 1.6 |

Appendix Table 18. Comparative chinook salmon catches by fishing period in District 1, Kuskokwim River. 1/

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/ HR. |
|---|---|---|---|---|---|
| 1980 | June 12 | 9,891 | 469 | 2,814 | 3.5 |
| | June 18 | 16,921 | 468 | 2,808 | 6.0 |
| Subtotal 2/ | | 26,812 | 553 | 5,622 | 4.8 |
| | June 23 | 4,777 | 426 | 2,616 | 1.8 |
| | June 26 | 1,460 | 408 | 2,448 | 0.6 |
| | July 02 | 498 | 383 | 2,298 | 0.2 |
| | July 09 | 445 | 431 | 2,586 | 0.2 |
| TOTAL | | 33,992 | 597 | 15,570 | 2.2 |
| 1981 | June 10 | 11,897 | 489 | 2,934 | 4.1 |
| | June 16 | 17,985 | 541 | 3,246 | 5.5 |
| Subtotal 2/ | | 29,882 | 589 | 6,180 | 4.8 |
| | June 22 | 3,830 | 511 | 3,066 | 1.25 |
| | June 25 | 2,000 | 508 | 3,048 | 0.66 |
| | June 30 | 2,563 | 484 | 2,904 | 0.88 |
| | July 02 | 1,707 | 459 | 2,754 | 0.62 |
| | July 06 | 1,088 | 461 | 2,766 | 0.39 |
| | July 09 | 491 | 440 | 2,640 | 0.37 |
| TOTAL | | 42,011 | 613 | 23,358 | 1.80 |
| 1982 | June 14 | 4,912 | 464 | 2,784 | 1.8 |
| | June 17 | 11,285 | 496 | 2,892 | 3.8 |
| | June 21 | 13,343 | 499 | 2,994 | 4.5 |
| | June 24 | 8,548 | 459 | 1,836 | 4.7 |
| Subtotal 2/ | | 38,088 | 610 | 10,506 | 3.6 |
| | June 28 | 1,943 | 352 | 1,408 | 1.38 |
| | June 30 | 2,064 | 483 | 1,932 | 1.07 |
| | July 02 | 1,095 | 434 | 1,736 | 0.63 |
| | July 05 | 875 | 372 | 2,232 | 0.39 |
| | July 08 | 748 | 435 | 2,610 | 0.29 |
| | July 12 | 307 | 354 | 2,124 | 0.14 |
| TOTAL | | 45,120 | 610 | 22,548 | 2.00 |

Appendix Table 18. Comparative chinook salmon catches by fishing period in District 1, Kuskokwim River. 1/ (Continued)

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/ HR. |
|---|---|---|---|---|---|
| 1983 | June 13 | 7,445 | 489 | 2,934 | 2.54 |
| | June 16 | 5,961 | 450 | 2,700 | 2.21 |
| Subtotal 2/ | | 13,406 | 544 | 5,634 | 2.38 |
| | June 20 | 4,776 | 474 | 2,844 | 1.68 |
| | June 23 | 3,287 | 450 | 2,700 | 1.22 |
| | June 27 | 2,566 | 446 | 2,676 | 0.96 |
| | June 30 | 2,359 | 547 | 3,282 | 0.72 |
| | July 04 | 1,213 | 443 | 2,658 | 0.46 |
| | July 07 | 1,202 | 496 | 2,976 | 0.40 |
| | July 11 | 633 | 466 | 2,796 | 0.23 |
| TOTAL | | 16,036 | 619 | 25,566 | 0.63 |
| 1984 | June 18 | 10,845 | 484 | 2,904 | 3.73 |
| | June 21 | 6,336 | 443 | 2,658 | 2.38 |
| Subtotal 2/ | | 17,181 | 520 | 5,562 | 3.08 |
| | June 25 | 3,018 | 466 | 2,796 | 1.08 |
| | June 28 | 2,625 | 470 | 2,820 | 0.93 |
| | July 02 | 1,988 | 483 | 2,898 | 0.69 |
| | July 05 | 1,218 | 426 | 2,556 | 0.48 |
| | July 09 | 1,211 | 496 | 2,976 | 0.41 |
| | July 12 | 858 | 436 | 2,616 | 0.33 |
| | July 16 | 744 | 373 | 2,238 | 0.33 |
| TOTAL | | 28,843 | 587 | 24,462 | 1.18 |

1985
1986

1/ The catch totals exclude small numbers of chinook salmon taken in late July and August.

2/ Unrestricted mesh size.

Appendix Table 19. Commercial chum salmon catches by fishing period during the chum salmon season, Kuskokwim River (District 1) 1971-1984.

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1971 | June 28-29 | 11,386 | 150 | 1,80 | 6.3 |
| | July 01-02 | 8,949 | 111 | 1,332 | 6.7 |
| | July 05-06 | 17,672 | 104 | 1,248 | 14.2 |
| | July 08-09 | 12,603 | 93 | 1,116 | 11.3 |
| | July 12-13 | 2,550 | 18 | 216 | 11.8 |
| | July 15-16 | 8,000 | 69 | 828 | 9.7 |
| | July 19-20 | 5,989 | 71 | 852 | 7.0 |
| | TOTALS | 67,149 | 216 | 7,392 | 9.1 |
| 1972 | June 29-30 | 9,863 | 87 | 1,044 | 9.4 |
| | July 03-04 | 19,084 | 115 | 1,380 | 13.8 |
| | July 06-07 | 19,839 | 101 | 1,212 | 16.4 |
| | July 10-11 | 13,972 | 113 | 1,356 | 10.3 |
| | July 13-14 | 6,290 | 80 | 960 | 6.6 |
| | TOTALS | 69,048 | 176 | 5,952 | 11.6 |
| 1973 | June 25-26 | 19,073 | 202 | 2,424 | 7.9 |
| | June 28-29 | 47,258 | 250 | 6,000 | 7.9 |
| | July 02-03 | 21,410 | 242 | 2,904 | 7.4 |
| | July 05-06 | 31,056 | 212 | 2,544 | 12.2 |
| | July 09-10 | 24,593 | 217 | 2,604 | 9.4 |
| | TOTALS | 143,390 | 341 | 16,476 | 8.7 |
| 1974 | June 27 | 27,017 | 267 | 1,602 | 16.9 |
| | July 01-02 | 55,356 | 380 | 4,560 | 12.1 |
| | July 04-05 | 27,211 | 282 | 3,384 | 8.0 |
| | July 08-09 | 50,672 | 376 | 4,512 | 11.2 |
| | July 18 | 6,661 | 190 | 1,140 | 5.8 |
| | TOTALS | 166,917 | 467 | 15,198 | 11.0 |
| 1975 | June 30 | 31,216 | 279 | 1,674 | 18.6 |
| | July 03 | 35,525 | 360 | 2,160 | 16.0 |
| | July 07 | 39,369 | 396 | 2,214 | 17.8 |
| | July 10 | 39,910 | 304 | 1,824 | 21.9 |
| | July 14 | 21,092 | 326 | 1,956 | 10.8 |
| | TOTALS | 167,112 | 539 | 9,828 | 17.0 |

Appendix Table 19. (continued)

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1976 | June 28 | 42,464 | 348 | 2,088 | 20.3 |
| | July 01 | 44,024 | 415 | 2,490 | 17.7 |
| | July 08 | 48,669 | 381 | 2,286 | 21.3 |
| | July 12 | 21,153 | 377 | 2,262 | 9.4 |
| | July 15 | 14,176 | 265 | 1,590 | 8.9 |
| | TOTALS | 170,486 | 517 | 10,716 | 15.9 |
| 1977 | June 27 | 40,321 | 378 | 2,268 | 17.8 |
| | June 30 | 58,884 | 409 | 2,454 | 24.0 |
| | July 04 | 37,500 | 331 | 1,986 | 18.9 |
| | July 07 | 56,943 | 368 | 2,208 | 25.8 |
| | July 14 | 24,765 | 385 | 2,310 | 10.7 |
| | TOTALS | 218,413 | 522 | 11,226 | 19.5 |
| 1978 | June 26 | 44,296 | 449 | 2,694 | 16.4 |
| | June 29 | 36,793 | 442 | 2,652 | 13.9 |
| | July 03 | 26,629 | 476 | 2,856 | 9.3 |
| | July 06 | 48,031 | 485 | 5,820 | 8.3 |
| | July 10 | 48,931 | 428 | 5,136 | 9.5 |
| | July 13 | 14,935 | 422 | 2,532 | 5.9 |
| | TOTALS | 219,615 | 617 | 21,690 | 10.1 |
| 1979 | June 22 | 32,295 | 502 | 3,012 | 10.7 |
| | June 26 | 53,648 | 531 | 3,186 | 16.8 |
| | June 29 | 48,643 | 542 | 3,252 | 14.9 |
| | July 03 | 83,164 | 542 | 3,252 | 25.6 |
| | July 10 | 32,434 | 520 | 3,120 | 10.4 |
| | TOTALS | 250,184 | 617 | 15,822 | 15.8 |
| 1980 | June 23 | 105,825 | 436 | 2,616 | 40.5 |
| | June 26 | 131,945 | 408 | 2,448 | 53.9 |
| | July 02 | 122,613 | 383 | 2,298 | 53.4 |
| | July 09 | 90,233 | 431 | 2,586 | 34.9 |
| | TOTALS | 450,616 | 579 | 9,948 | 45.2 |

Appendix Table 19. (continued)

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1981 | June 22 | 78,168 | 511 | 3,066 | 25.5 |
| | June 25 | 81,431 | 508 | 3,048 | 26.7 |
| | June 30 | 51,942 | 484 | 2,904 | 17.9 |
| | July 02 | 58,594 | 459 | 2,754 | 21.3 |
| | July 06 | 55,799 | 461 | 2,766 | 20.2 |
| | July 09 | 66,138 | 440 | 2,640 | 25.0 |
| | TOTALS | 392,072 | 613 | 17,178 | 22.8 |
| 1982 | June 28 | 58,528 | 352 | 1,408 | 41.6 |
| | June 30 | 47,773 | 483 | 1,932 | 24.7 |
| | July 02 | 38,918 | 434 | 1,736 | 22.4 |
| | July 05 | 29,315 | 372 | 2,232 | 13.1 |
| | July 08 | 28,942 | 435 | 2,610 | 11.9 |
| | July 12 | 20,709 | 354 | 2,124 | 9.8 |
| | TOTALS | 224,185 | 576 | 12,042 | 18.6 |
| 1983 | June 20 | 28,915 | 474 | 2,844 | 10.2 |
| | June 23 | 24,625 | 450 | 2,700 | 9.1 |
| | June 27 | 44,802 | 446 | 2,676 | 16.7 |
| | June 30 | 55,209 | 547 | 3,282 | 16.8 |
| | July 04 | 46,176 | 443 | 2,658 | 17.4 |
| | July 07 | 36,965 | 496 | 2,976 | 12.4 |
| | July 11 | 20,560 | 466 | 2,769 | 7.4 |
| | TOTALS | 257,252 | 619 | 19,905 | 12.9 |
| 1984 | June 25 | 91,773 | 466 | 2,796 | 32.8 |
| | June 28 | 67,120 | 470 | 2,820 | 23.8 |
| | July 02 | 69,897 | 483 | 2,898 | 24.1 |
| | July 05 | 54,981 | 426 | 2,556 | 21.5 |
| | July 09 | 36,440 | 496 | 2,976 | 12.1 |
| | July 12 | 24,269 | 436 | 2,616 | 9.3 |
| | July 16 | 18,613 | 373 | 2,238 | 8.3 |
| | TOTALS | 363,093 | 587 | 18,900 | 19.2 |

APPENDIX TABLE 20. Commercial coho salmon catches by week, lower Kuskokwim River (District 1), 1974-1984.

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1974 | Aug 01-02 | 9,576 | 267 | 3,444 | 2.8 |
| | Aug 05-08 | 59,090 | 444 | 31,968 | 1.9 |
| | Aug 12-15 | 58,066 | 396 | 28,512 | 2.0 |
| | Aug 19-22 | 12,301 | 263 | 18,936 | 0.6 |
| | Aug 26-29 | 5,360 | 107 | 7,704 | 0.7 |
| | Sept 02-05 | 430 | 25 | 1,815 | 0.2 |
| | TOTALS | 144,823 | 516 | 92,379 | 1.6 |
| 1975 | Aug 01 | 2,357 | 142 | 852 | 2.8 |
| | Aug 04-06 | 12,500 | 292 | 14,016 | 0.9 |
| | Aug 11-13 | 18,551 | 373 | 17,904 | 1.0 |
| | Aug 18-20 | 34,435 | 388 | 18,624 | 1.9 |
| | Aug 25-27 | 16,277 | 270 | 12,960 | 1.3 |
| | TOTALS | 84,120 | 531 | 64,356 | 1.3 |
| 1976 | Aug 02-03 | 10,534 | 286 | 6,864 | 1.5 |
| | Aug 09-11 | 29,728 | 400 | 19,200 | 1.5 |
| | Aug 16-18 | 28,664 | 387 | 18,576 | 1.5 |
| | Aug 23-25 | 14,543 | 300 | 14,400 | 1.0 |
| | Aug 30-31 | 4,420 | 174 | 7,308 | 0.6 |
| | TOTALS | 87,889 | 516 | 66,348 | 1.3 |
| 1977 | Aug 1- 2 | 23,987 | 360 | 8,640 | 2.8 |
| | Aug 08-10 | 91,474 | 487 | 23,376 | 3.9 |
| | Aug 15-16 | 60,935 | 438 | 10,512 | 5.8 |
| | Aug 18 | 25,589 | 378 | 4,536 | 5.6 |
| | Aug 22 | 16,980 | 361 | 4,332 | 3.9 |
| | Aug 25 | 11,874 | 264 | 3,168 | 3.8 |
| | Aug 29 | 6,819 | 204 | 2,448 | 2.8 |
| | TOTALS | 237,658 | 572 | 57,012 | 4.2 |
| 1978 | Aug 01 | 6,311 | 297 | 3,564 | 1.7 |
| | Aug 04 | 9,455 | 364 | 4,368 | 2.2 |
| | Aug 08 | 20,501 | 433 | 5,196 | 5.5 |
| | Aug 11 | 42,428 | 485 | 5,820 | 7.3 |
| | Aug 15 | 48,950 | 476 | 5,712 | 8.6 |
| | Aug 18 | 29,485 | 434 | 5,208 | 5.7 |
| | Aug 22 | 22,287 | 396 | 4,752 | 4.7 |
| | Aug 25 | 11,168 | 293 | 3,516 | 3.2 |
| | Aug 29 | 12,215 | 250 | 3,000 | 4.1 |
| | TOTALS | 210,790 | 597 | 41,136 | 5.2 |

APPENDIX TABLE 20. (continued)

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1979 | Aug 02 | 52,276 | 478 | 5,736 | 9.1 |
| | Aug 06 | 53,797 | 480 | 2,880 | 18.7 |
| | Aug 09 | 26,422 | 497 | 2,982 | 8.9 |
| | Aug 13 | 27,915 | 463 | 2,778 | 10.1 |
| | Aug 16 | 21,675 | 467 | 2,802 | 7.7 |
| | Aug 20 | 19,445 | 390 | 2,340 | 8.3 |
| | Aug 23 | 5,376 | 328 | 1,968 | 2.7 |
| | Aug 27 | 6,342 | 310 | 3,720 | 1.7 |
| | Aug 30 | 2,182 | 179 | 2,148 | 1.0 |
| | TOTALS | 215,430 | 613 | 27,354 | 7.9 |
| 1980 | Aug 02 | 9,889 | 375 | 2,250 | 4.4 |
| | Aug 07 | 36,126 | 455 | 2,730 | 13.2 |
| | Aug 11 | 35,178 | 482 | 2,892 | 12.2 |
| | Aug 14 | 28,211 | 439 | 2,634 | 10.7 |
| | Aug 18 | 43,748 | 441 | 2,646 | 16.5 |
| | Aug 21 | 33,274 | 419 | 2,514 | 13.2 |
| | Aug 25 | 19,264 | 370 | 2,220 | 8.7 |
| | Aug 28 | 13,484 | 319 | 1,914 | 7.0 |
| | TOTALS | 219,174 | 586 | 19,800 | 11.1 |
| 1981 | Aug 03 | 16,184 | 430 | 2,580 | 6.3 |
| | Aug 06 | 13,885 | 441 | 2,646 | 5.3 |
| | Aug 10 | 26,972 | 445 | 2,670 | 10.1 |
| | Aug 13 | 46,252 | 473 | 2,838 | 16.6 |
| | Aug 17 | 34,739 | 458 | 2,748 | 12.6 |
| | Aug 20 | 24,184 | 380 | 2,280 | 10.6 |
| | Aug 24 | 23,771 | 372 | 2,232 | 10.6 |
| | Aug 27 | 13,785 | 346 | 2,076 | 6.6 |
| | Aug 31 | 8,096 | 278 | 1,668 | 4.8 |
| | TOTALS | 207,868 | 586 | 21,738 | 9.6 |
| 1982 | July 29 | 19,561 | 416 | 2,496 | 7.8 |
| | Aug 02 | 31,944 | 388 | 2,328 | 13.7 |
| | Aug 05 | 35,766 | 455 | 2,670 | 13.4 |
| | Aug 09 | 61,231 | 442 | 2,652 | 23.1 |
| | Aug 12 | 80,685 | 449 | 2,694 | 30.0 |
| | Aug 16 | 77,785 | 420 | 2,520 | 30.9 |
| | Aug 19 | 49,566 | 403 | 2,418 | 20.5 |
| | Aug 23 | 25,218 | 349 | 2,094 | 12.0 |
| | Aug 26 | 26,761 | 314 | 1,884 | 14.2 |
| | Aug 30 | 26,815 | 302 | 1,812 | 14.8 |
| | TOTALS | 435,332 | 597 | 23,568 | 18.5 |

APPENDIX TABLE 20. (continued)

| YEAR | DATE | CATCH | FISHERMEN | FISHERMEN HOURS | CATCH/HR. |
|---|---|---|---|---|---|
| 1983 | Aug 01 | 9,767 | 377 | 2,262 | 4.3 |
| | Aug 04 | 15,389 | 430 | 2,580 | 5.9 |
| | Aug 08 | 34,541 | 383 | 2,298 | 15.0 |
| | Aug 11 | 35,268 | 485 | 2,910 | 12.1 |
| | Aug 15 | 24,072 | 462 | 2,772 | 8.7 |
| | Aug 18 | 22,822 | 408 | 2,448 | 9.3 |
| | Aug 22 | 34,918 | 388 | 2,328 | 15.0 |
| | Aug 26 | 19,039 | 323 | 1,938 | 9.8 |
| | TOTALS | 195,816 | 577 | 19,536 | 10.0 |
| 1984 | July 30 | 56,609 | 459 | 2,754 | 20.6 |
| | Aug 02 | 79,240 | 401 | 2,406 | 32.9 |
| | Aug 06 | 84,406 | 542 | 4,878 | 17.3 |
| | Aug 09 | 80,990 | 523 | 4,707 | 17.2 |
| | Aug 13 | 80,268 | 504 | 4,536 | 17.7 |
| | Aug 16 | 78,342 | 502 | 4,518 | 17.3 |
| | Aug 20 | 63,829 | 491 | 4,419 | 14.4 |
| | Aug 23 | 49,372 | 481 | 4,329 | 11.4 |
| | Aug 27 | 16,472 | 350 | 3,150 | 5.2 |
| | Aug 30 | 11,222 | 210 | 1,890 | 5.9 |
| | Sept 03 | 1,603 | 60 | 360 | 4.5 |
| | Sept 06 | 1,877 | 39 | 234 | 8.0 |
| | TOTALS | 604,230 | | 38,181 | 15.8 |

Appendix Table 21. Summary of important regulation changes affecting the commercial herring fishery in Security Cove and Goodnews Bay districts, 1977-1984.

| YEAR | ACTION TAKEN | EXPLANATION |
|---|---|---|
| 1977 | Established commercial fishing districts of Security Cove and Goodnews Bay. | Security Cove district defined as all waters between the latitude of then northern most point of Carter Spit and the latitude of Cape Newenham, excluding Goodnews Bay. The Goodnews Bay consists of the portion of Goodnews Bay inside a line between markers placed near the bay entrance and a line between markers placed near the mouth of the Ufigag River and on the opposite shore near the mouth of the Tunulik River. |
| | Specified that herring may be taken by the use of purse seines, and gill nets in the Security Cove district. Gill nets only could be used in the Goodnews Bay district. | To identify appropriate gear types to be operated in these districts. |
| | Established purse seine and gillnets specifications. | In both districts, the gill net mesh size was restricted to not less than 2 1/8 inches and not more than 3 inches. Total of 150 fathoms of the herring gill net permitted to be operated from single licensed fishing vessel; no single herring gill net allowed to exceed 50 fathoms. In Security Cove seines were restricted to maximum of 850 meshes in depth, no seine was permitted to be more than 150 fathoms in length. |

Appendix Table 21. Summary of important regulation changes affecting the commercial herring fishery in Security Cove and Goodnews Bay districts, 1977-1984 (continued).

| YEAR | ACTION TAKEN | EXPLANATION |
|---|---|---|
| 1977 | Established harvest guideline of 100 metric tons for Goodnews Bay district, and 350 metric tons for Security Cove district. | To provide for conservative development of the Security Cove and Goodnews Bay commercial herring fishery. |
| 1978 | Established the commercial season from May through June 30 in the Security Cove district and provided for the fishing season to be opened and closed by emergency order in the Goodnews Bay district. | To provide for more discretely defined fishing seasons by regulation. Resulted in establishing primarily a sac roe fishery. |
| | Eliminate the use of purse seines in the Security Cove district. | To provide for a limited harvest by gear type and consequently allow a more even harvest from a wider segment of the herring population. |
| | Reduced the aggregate length for herring gill nets to 100 fathoms in the Security Cove and Goodnews Bay districts. | To minimize potential gear conflicts. |
| | Closed Waters section adopted. | To restrict the fishing activities to the areas where herring has been identified. |
| | Prohibited any commercial harvest of herring spawn and herring spawn on kelp. | To protect the herring spawning grounds in areas where relatively small herring populations are present. |
| 1979 | Increase the harvest guidelines to 750 and 300 metric tons in the Security Cove and Goodnews Bay districts, respectively. | To allow an increased commercial harvest in these districts. |

Appendix Table 21. Summary of important regulation changes affecting the commercial herring fishery in Security Cove and Goodnews Bay districts, 1977-1984 (continued).

| YEAR | ACTION TAKEN | EXPLANATION |
|---|---|---|
| 1979 | Establish a new section to deal with buyer reporting requirements. | Require that processors register with the Department upon arrival on the fishing grounds. Processors shall identify all tenders and establish a daily schedule to report herring purchased. Fish tickets are to be submitted prior to a buyer leaving the district or within 10 days after the closure of the commercial fishery. |
| 1980 | Established the opening of the Security Cove and Goodnews Bay herring fishery by emergency field order. | To allow for a flexible inseason management strategy. |
| | Reduced the total gear limit in the Security Cove and Goodnews Bay district to be not more than 100 fathoms. Provide for a single gill net to be less than 50 fathoms, providing the gill net is attached to a commercial herring fishing vessel and net is personally attended by an interim use or permit holder. | To minimize the gear congestion present in this district and to allow for test or sample fishing. This test fish would allow fishermen to evaluate the quality of a school of herring, leading to overall decrease in wastage of unmarketable herring. |
| 1981 | None | |
| 1982 | None | |
| 1983 | None | |
| 1984 | None | |

Appendix Table 22. Estimated biomass of Pacific herring in the Kuskokwim Area, 1978-1984.

| DISTRICT | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|
| | | | | Estimated Biomass in mt 1/ | | | |
| Security Cove | 1,200 | 19,500 | 1,100 | 7,500 | 4,600 2/ | 5,800 | 4,600 |
| Goodnews Bay | 400 | 6,700 2/ | 1,000 2/ | 3,900 | 2,400 2/ | 2,900 | 3,700 |
| Nelson Island | 5,400 | 5,400 2/ | 1,100 2/ | 3,600 | 3,600 2/ | 6,600 | 10,000 |
| Nunivak Island | 731 | - | - | 17 | - | 6,900 | 6,074 |
| TOTAL | 7,731 | 31,600 | 7,600 | 15,017 | 10,600 | 22,200 | 24,374 |

1/ Adjusted for presence of non-herring pelagic species. Estimated for 1978 and 1979 represent low end of estimate ranges from Barton and Steinhoff (1980), 1980 estimates from Kingsbury (1980).

2/ Imcomplete data due to inclement weather and/or turbid waters, biomass estimates are questionable and are based on 1978 or 1981 data.

Appendix Table 23. Herring commercial harvest data for Security Cove and Goodnews Bay districts, 1978-1984.

| DISTRICT | HARVEST (m.t) | EXPLOITATION RATE | ROE PERCENT | ESTIMATED VALUE ($'s) |
|---|---|---|---|---|
| 1978 | | | | |
| Security Cove | 259 | 21.6 | | - |
| Goodews Bay | 0 | - | (40 lbs) | - |
| | | 1979 | | |
| Security Cove | 385 | 2.0 | 8.5 | $327,000 |
| Goodnews Bay | 82 | 1.2 | 4.7 | 38.500 |
| 1980 | | | | |
| Security Cove | 632 | 57.4 | 8.2 | 151,000 |
| Goodnews Bay | 406 | 36.9 | 9.5 | 97,000 |
| 1981 | | | | |
| Security Cove | 1,064 | 14.2 | 8.1 | 374,000 |
| Goodnews Bay | 596 | 15.3 | 7.7 | 196,000 |
| 1982 | | | | |
| Security Cove | 737 | 15.9 | 9.3 | 284,000 |
| Goodnews Bay | 441 | 18.3 | 9.5 | 167,000 |
| 1983 | | | | |
| Security Cove | 973 | 16.8 | 9.4 | 450,000 |
| Goodnews Bay | 395 | 16.5 | 9.4 | 180,000 |
| 1984 | | | | |
| Security Cove | 295 | 6.6 | 11.8 | 110,000 |
| Goodnews Bay | 605 | 17.5 | 10.1 | 168,000 |

Appendix Table 24. Number of buyers and fishermen participating in commercial herring fisheries in Security Cove and Goodnews Bay districts, 1978-1984.

| DISTRICT | NUMBER OF BUYERS | NUMBER OF FISHERMEN | |
|---|---|---|---|
| | | GILL NET | PURSE SEINE |
| 1978 | | | |
| Security Cove | 3 | - | 7 |
| Goodnews Bay | 0 | 1 | 0 |
| 1979 | | | |
| Security Cove | 2 | 61 | CLOSED |
| Goodnews Bay | 1 | 41 | |
| 1980 | | | |
| Security Cove | 8 | 175 | TO |
| Goodnews Bay | 4 | 165 | |
| 1981 | | | |
| Security Cove | 7 | 113 | PURSE |
| Goodnews Bay | 5 | 175 | |
| 1982 | | | |
| Security Cove | 3 | 107 | SEINE |
| Goodnews Bay | 3 | 84 | |
| 1983 | | | |
| Security Cove | 3 | 94 | |
| Goodnews Bay | 3 | 63 | |
| 1984 | | | |
| Security Cove | 4 | 38 | |
| Goodnews Bay | 4 | 130 | |

Appendix Table 25. Subsistence herring catch (in metric tons) and effort data for selected villages, eastern Bering Sea, Alaska 1975-1984 1/

| VILLAGE | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 2/ | 1984 3/ |
|---|---|---|---|---|---|---|---|---|---|---|
| NELSON ISLAND | | | | | | | | | | |
| Tununak | 19.8 | 13.9 | 51.9 | 34.6 | 31.0 | 59.2 | 36.0 | 43.8 | 85.0 | - |
| Umkumiut | 30.0 | 8.5 | 2.8 | 10.4 | 7.5 | 3.1 | 9.0 | 0 | - | - |
| Toksook Bay | 31.0 | 31.8 | 19.3 | 33.5 | 46.5 | 26.6 | 13.0 | 31.6 | - | - |
| TOTAL | 80.8 | 61.2 | 74.0 | 78.5 | 85.0 | 88.9 | 58.0 | 75.4 | 85.0 | - |
| Number of Fishing Families | 109 | 42 | 90 | 83 | 54 | 70 | 93 | 65 | 43 | - |
| OTHER KUSKOKWIM VILLAGES | | | | | | | | | | |
| Kwigillingok | - | 9.6 | 0.9 | - | 7.2 | 12.0 | - | 12.0 2/ | - | - |
| TOTAL CATCH | 80.8 | 70.8 | 74.9 | 78.5 | 92.2 | 100.9 | 58.0 | 87.4 | 85.0 | - |

1/ Other areas with small catches have been surveyed irregularly (1975-1978 extimated total coastal yearly subsistence catch averaged 100 m.t.).
2/ Survey by Subsistence Division, no survey by C.F. due to limited funds.
3/ No survey was conducted in 1984 due to limited funds.

Appendix Table 26. Area 4E Halibut catches in pounds. 1/

| YEAR | POUNDS |
|---|---|
| 1982 | 8,148 |
| 1983 | 35,248 |
| 1984 | 35,000 |

1/ From International Pacific Halibut Commission.